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IDAHO SOLID WASTE MANAGEMENT INDUSTRIAL SURVEY REPORT

Idaho Department of Environmental and Community Services

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Industrial solid waste information is an integral part of developing any comprehensive statewide solid waste management plan. For this reason, an industrial solid waste survey was conducted to compile information on the types and amounts of solid waste generated and the solid waste management techniques employed by Idaho's manufacturing industries. Whenever possible, the survey was conducted utilising personal interviews. Most survey forms were completed during the interview. Many of the companies survey are utilizing acceptable solid waste management practices. Recycling is usually practiced whenever a company generates a sufficient volume of recyclable material within an economically feasible distance of an existing market. The conversion of municipal, county, and company-owned dumps to sanitary landfills will alleviate the majority of unacceptable solid waste practices. In some instances, collection and storage practices should also be updated. A comprehensive company-wide analysis and restructuring of the companies' existing solid waste practices should also be updated. A comprehensive company-wide analysis and restructuring of the companies' existing solid waste practices should prove to be economically beneficial as well as helping to project a progressive company image.

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INDUSTRIAL SURVEY REPORT

June 1973

IDAHO DEPARTMENT OF

ENVIRONMENTAL AND COMMUNITY SERVICES

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ABSTRACT

Industrial solid waste information is an integral part of developing any comprehensive statewide solid waste management plan. For this reason, an industrial solid waste survey was conducted to compile information on the types and amounts of solid waste generated and the solid waste management techniques employed by Idaho's manufacturing industries.

Whenever possible, the survey was conducted utilizing personal interviews. Most survey forms were completed during the interview. However, due to the complexity of their solid waste practices, some larger companies completed the form after the interview.

Many of the companies surveyed are utilizing acceptable solid waste management practices. Some companies, however, continue to employ antiquated techniques. Recycling is usually practiced whenever a company generates a sufficient volume of recyclable material within an economically feasible distance of an existing market.

The conversion of municipal, county, and company-owned dumps to sanitary landfills will alleviate the majority of unacceptable solid waste practices. In some instances, collection and storage practices should also be updated. A comprehensive company-wide analysis and restructuring of the companies' existing solid waste practices should prove to be economically beneficial as well as helping to project a progressive company image.

Abstract
Industrial Survey Report

A well developed, comprehensive recycling plan at all levels appears to be the ultimate answer to the growing solid waste problem. The various industries and companies can assist in this operation by cooperation and communication between themselves in the hope of utilizing a portion of another company's solid waste stream as a raw material for their own operation.

INTRODUCTION

Comprehensive solid waste management plans can be formulated only if reliable information is available as to the types and amount of waste material generated. This requires specific information about the various sources of solid waste. The major types of solid wastes are: residential and commercial, construction and demolition, institutional, industrial and mining, agricultural, and miscellaneous municipal solid waste.

This survey was conducted in order to compile detailed and specific information on the generation, processing, storage, collection, and disposal of industrial solid wastes. A stratification of industry types was accomplished by utilizing the Standard Industrial Classification Code. Each establishment is assigned an industry code on the basis of its major activity. The major activity is determined by the product produced or handled, or services rendered. The structure of the classification code makes it possible to classify establishments by industry on a two digit, three digit, or four digit basis. A major two digit group contains more detailed three digit groups which, in turn, contain industries specified to even more detail in a four digit SIC number.

A random sampling process was applied to each three digit group of industries. The sample size was chosen according to accepted statistical practices.

With the exception of the hazardous waste section, the industrial survey form used (see Appendix A) was developed by the Federal Environmental Protection Agency and is designed to compile very detailed information. During the course of the survey, it was recognized that the form required far more detailed information than the sources could generate. Due to the specific nature of the form, large sections did not apply to the smaller Idaho industries. A shortage of departmental manpower limited the amount of time that could be spent in survey of each company. It was also recognized that the companies should not be asked to attempt the impossible job of estimating specifics to decimal place accuracy. A shorter, more concise form specifically designed to gather general information would have been much more compatible with the type of industry in Idaho.

Some respondents did not wish to divulge information that would give their competitors any advantage.

DISCUSSION

In order to achieve a more informative discussion, the Idaho industries have been grouped by similarity of operation. These survey groups sometimes encompass an entire SIC major group (two digit), and in other instances are limited to a three or four digit SIC group. A description of these survey groups and their relation to the three digit SIC groups is given in Appendix B.

The confidential nature of much of the information prevented the association of any data with any specific company. If any survey group contains less than four companies, no data will be released.

One of the advantages of a random sampling survey is that the data can be used to compute solid waste generation figures for similar companies. With this in mind, the discussion section of Appendix C illustrates a procedure which could be used to extrapolate solid waste data for companies not surveyed.

Survey Group 1
SMALL ARMS AMMUNITION
SIC Number 196

The ordinance industry in Idaho includes three firms who employ less than 500 people. These firms are all located in northern Idaho and produce small arms ammunition, reloading equipment, and related accessories.

The waste generated at these plants is made up of the normal packing and receiving waste (which is mostly paper) and metals from the manufacturing process. These metals include shavings from lathe work and a small amount of scrap steel from bar stock. The major metal waste is gilving metal, a high value, copper-zinc alloy metal used in ammunition.

The paper waste and metal shavings are stored in commercial refuse bins, barrels, and boxes until the waste is collected and disposed of by the community contract refuse haulers at the community disposal site. Steel scrap is sold to local scrap dealers. The gilving metal is packed and shipped by the company to distant markets.

The only potentially hazardous waste materials that were mentioned by this survey group were a few empty paint and paint thinner containers (Appendix D). However, they were handled in the same manner as the packing and receiving waste.

Survey Group 2
MEAT PRODUCTS
SIC Number 201

The meat products industry in Idaho consists primarily of meat packing plants (three of which have their own on-site rendering operations), and a specialty meat processor, and a fowl and game bird processing plant.

The industry is concentrated in southern Idaho on the Snake River plain with smaller plants serving local needs throughout the State. The meat industry is somewhat cyclic depending on supply and demand, but is not necessarily seasonal, except for the small plants which process large and small game animals. The industry is characterized by a large number of firms which employ five or less production people and cater to small local markets and/or custom slaughtering and the processing of customer owned animals. The other group employs approximately 20 or more production workers. They are either firms which produce a broad line of meat items sold to the retail trade in a large area of the state or are firms that are somewhat specialized and ship to the large population centers.

Twenty-four meat products firms were surveyed which employ approximately 370 production workers and process an estimated 185,000 beef, 64,000 hogs, 2,400 sheep, and 19,000 miscellaneous fowl and game animals per year.

The generation of waste materials includes: plant trash (which is usually composed of paper, cardboard, wood, casings, cans, bottles, a little plastic and small plant maintenance items); paunch manure; and, in some plants, blood and offal.

Plant trash is stored in barrels, refuse bins, and piles. Subsequent management includes incineration, open burning and/or collection and removal to a company or community refuse disposal site. The management of paunch manure includes storage or disposal in lagoons, sewers, manure pits, piling with feedlot manure, spreading on land, or hauling to a solid waste disposal site. Blood, if not dried, is managed in about the same manner as the paunch manure. Offal is considered to be a valuable by-product and is either rendered on site by the plant or stored and sold to a rendering plant. In many small plants, the offal is not considered to be a desirable by-product because of the problems associated with storage, odors, cooling, cleaning, collection and aesthetics.

Collection and transportation of rubbish waste material is usually accomplished with the company employees and equipment. Contract rubbish collectors are utilized at only a very few plants. The rubbish is landfilled on site or at a community landfill. When unprocessed by-products (such as hides, offal, and bone) are sold, the purchaser is responsible for the collection at the plant site.

Total internal capital and operational costs for environmental control are high. However, investment in one area of environmental control may result in added financial gain or in solving problems in other environmental areas of concern; for example: 1) on-site rendering results in the increased value of by-products and helps solve problems associated with storage, cooling, and collection of offal; 2) waste water treatment lagoons are often used for the disposal of blood and paunch manure in addition to process water; and 3) feedlot and holding pen cleaning equipment and trucks have been used on other projects such as building lagoons, maintaining the company landfill, and hauling a variety of waste materials.

The hazardous waste potential is low because the materials used which would qualify as toxic are U.S.D.A. approved food-plant cleaning compounds that are sewered after use and aerosol cans of relatively non-toxic pyrethrin fly spray. The containers from these materials are handled with the regular plant rubbish, except for the steel and fiberboard barrels which are usually washed and used internally or externally as rubbish containers. (For additional information on waste and handling, see Appendices C and D).

Survey Group 3
DAIRY PRODUCTS
SIC Number 202

The milk industry in Idaho produces natural cheese, fluid milk products, evaporated milk, processed cheese, ice cream, dry milk powder, butter, stick novelties, and specialty products such as yogurt, sour cream, and cottage cheese. A number of the smaller firms selected for the survey had discontinued processing operations and had confined their business to distribution of dairy products or had gone out of business.

The industry is located in all sections of the State, but the major concentration is in southern Idaho on the Snake River plain.

Milk supply at some plants, particularly in the colder areas of the State, still has a definite seasonal trend. The output products of ice cream, novelties, and specialty products also have a definite summer seasonal trend.

The surveyed industries employed approximately 646 production workers and processed approximately 603 million pounds of raw milk.

The primary waste generated by the industry is whey. Whey is a by-product resulting from the processing of natural and cottage cheese. Though whey can be managed in the same manner as municipal sewage (as it is in several cases), it is very difficult to treat. The preferred method of managing whey is to dry it for a by-product or direct it to land disposal or animal feed. Buttermilk is handled

in the same manner. However, the volume of it is quite small compared to whey, and the animal food characteristics are better. All plants generate plant trash, which consists primarily of paper, wood, plastic, glass, fiberboard, metal cans, and steel banding. A small amount of product waste is also involved which includes returns from delivery routes, dropped or spilled product, floor sweepings, etc. This material is often saved in a barrel or similar container and is given or sold to employees or others who are feeding animals on their acreages or farms.

Storage of whey or buttermilk, where it is not dried or disposed of in a sewage system, is accomplished by storing it in holding tanks or pumping it directly into an awaiting tank truck.

Plant trash is stored in galvanized cans, fiberboard and metal drums, and standard commercial refuse bins. A large number of the plants subscribe to solid waste collection services from a city or a contractor for a city. A few haul their own material to the community disposal site. There are a few plant incinerators used for volume reduction of combustible material. Of interest here is that one city has built concrete block incinerators on many of the city blocks in the business and commercial zones for the businesses on that block to use, which reduces the volume that the municipal collection service has to collect. Both the incinerator and collection service are included as one item on the city's utility bill.

A small amount of metals are salvaged each year from plant maintenance and changeover of equipment and piping. One plant which makes their own metal cans for evaporated milk does salvage and return to the manufacturer a substantial amount of clean tin plate from the can-making process. Solid waste data are listed in Appendix C.

Hazardous waste potential of the dairy industry is low in that hazardous material used by the industry are U.S.D.A. approved cleaning materials and fly spray. Once used, these materials are sewered or dissipated. The cleaning materials usually come in fiberboard or steel barrels with plastic sack liners. The liners are discarded in the plant trash, and the barrels are used internally or externally for trash containers or are discarded with the plant trash. The fly spray used usually comes in aerosol cans, and the empty cans are put in the plant trash. Sulfuric acid is also used in the plant lab for butterfat testing. The used sulfuric acid is either diluted and discharged to the sewer or saved in a ceramic jug and carefully spread on sand where it can act as a soil sterilant (Appendix D).

Survey Group 4
CANNED AND PRESERVED FRUITS
AND VEGETABLES
SIC Number 203

The canned and preserved fruits, vegetables, and frozen fish industry is one of the larger industries in the State, employing over 10,000 production workers. Potato processing is the bulk of the industry--the balance being comprised of corn, green and other vegetables, some fruit, frozen fish, and a number of small cooperative custom canneries.

The major concentration of this industry is located in southern Idaho on the Snake River plain with a few plants in other sections of the state.

Generation of waste includes food process waste, sewage treatment sludge, dirt, and vines from mechanical shakers, silt, lagoon residue, paper, wood, plastics, glass, cans, scrap metal, and ashes. Tonnages of food process waste are quite large. Approximately 25% of the Idaho processed potato crop ends up as silage (see Appendix C).

The handling of food process waste and sewage treatment sludges involves large capital expenditures for such items as vacuum filters, conveyors, bins, and other items. The materials are handled continuously and are used as cattle feed in commercial and company owned feedlots. The material is both conveyed and trucked to storage

and to feedlots. Trucking arrangements include both company and purchaser owned or contracted services. One of the more efficient trucking systems utilizes back haul of food process waste, on the harvest trucks, to growers who also feed cattle.

In potato processing, there is usually about 5% tare dirt and vine on the incoming potatoes which is shaken off while conveying them in and out of storage and transporting them to the beginning of the processing line. This dirt is usually cleaned up by the work crews and piled adjacent to the work areas until it can be hauled away. It is often hauled by the plant maintenance people and used for fill dirt on the plant site, off-site fill material, and cover material at community solid waste disposal sites.

The first step in potato processing is to wash the potatoes, which yield silt in the wash water settling ponds. Settling ponds have only been required in the last several years, and some of the companies have not yet had to dredge these ponds. Those that have had to dredge have used this material either to build up their pond dikes or for on or off-site fill material.

Both ferrous and some non-ferrous metals are generated each year from the plant maintenance and production line changes. This scrap metal and machinery ends up in company scrap iron piles and bone yards where it is cannibalized for parts and new fabrication. The remainder is finally sold to scrap-iron dealers.

The plant trash, consisting of everything from office waste paper to burned out light bulbs to damaged product containers, is usually stored in a manner that appears reasonable and expedient. This waste is handled and hauled by company employees and equipment to a company or community solid waste disposal site. Several companies have subscribed to contract or municipal refuse collection and disposal services where this service is adequate to meet their need. Hazardous waste materials include caustic solutions, insecticides, fungicides, and fumigants. Appendix D lists these materials in more detail.

Survey Group 5
GRAIN MILL PRODUCTS
SIC Number 204

The surveyed portion of the grain mill products industry in Idaho included seven firms which employed 192 production workers. The industries surveyed were primarily located in southern Idaho, and their main product was food for animals, fish and fowl.

The waste generated at these firms included crop and feed waste (grain spillage, chaff, imperfect seed, cobs, husks, and dirt), paper, a little wood, ash, metals, and pesticides and containers.

Of the crop and feed waste generated, approximately 23% was delivered to a community solid waste disposal site by the company for disposal (this was the dirt, chaff, and weed seed fraction). The balance of the crop and feed waste was recycled for livestock use.

Paper, wood, metals, and ash materials were handled exclusively by the companies--usually on an as-needed basis. Disposal was accomplished by burning or delivery to the community disposal site.

Pesticides and their containers were either buried on company property or delivered to the community disposal site. For additional information, see Appendices C and D.

Survey Group 6
BAKERIES AND CONFECTIONARIES
SIC Numbers 205 & 207

The surveyed portion of the bakery and confectionary groups included eight firms which employed 244 production workers. The firms are distributed throughout Idaho in the population centers.

Waste materials generated by these firms included paper, wood, plastic wrap, food process waste, and metals in the form of cans, food ingredient barrels, and a little junk and soap.

The waste materials are all lumped together and managed as one unit, except for the food ingredient barrels, which are sold to another food company for food storage. The food process waste, which is usually stored in barrels, is sold at the plant to farmers who use it for swine feeding. Paper sacks from flour and sugar at one bakery are bundled and sold at the plant to an animal foods firm which reuses them for animal food containers.

The balance of the waste material is generally stored in bulk commercial refuse containers with a few firms using barrels, cardboard boxes, and open piles as an alternate storage method. Two firms provided their own collection and transportation service with the company pickup truck, and the rest use the community's contract refuse collection service.

Disposal is at the local community's sanitary landfill, except for one firm which uses the county dump that is provided for community use.

Capital costs for waste management are very low. Internal and external cost and salvage income are low to moderate for this type and size of business (see Appendix C for more information).

The hazardous waste potential for this industry includes the cleaning compounds, which are sewered after use, and their containers, which are managed with the other solid waste generated in the plant and disposed of at community solid waste disposal sites (Appendix D).

Survey Group 7
SUGAR
SIC Number 206

There are four sugar plants in Idaho which process approximately 3,200,000 tons of sugar beets per year. The processing season starts during the fall harvest and extends up to 28 weeks thereafter. In excess of 2,500 seasonal production workers are employed during that time. A much smaller staff of workers are employed year-around for shipping, receiving, maintenance, and construction work. The plants are all located in southern Idaho in the heavily agricultural counties.

The companies maintain a number of beet receiving stations scattered throughout the agricultural community. The beets are received from the farmers' trucks, are stored and transferred to either rail cars or trailer trucks to provide an orderly flow of the product to the plants.

At the receiving station the beets are mechanically cleaned. Excess dirt, vine, and small chunks of broken-off beets are returned to the farmers' trucks. This return tare dirt poses a problem for the farmer in that it has been exposed to the common dumping bin and mechanical cleaning equipment. There is, therefore, the possibility that it may contain nematode and weed seed from other growers' fields. As a consequence, growers usually do not dump their tare dirt on row crop land but do deposit this tare on other areas. Occasionally, a nuisance will develop in the form of odor, fly breeding, and

aesthetics--particularly where the tare material is piled rather than spread.

The sugar industry has some severe pollution problems that they have been working on. As a result, the industry converts a portion of their wet beet pulp waste to a dried pulp by-product which is sold for animal feed. Settling ponds and lagoons have been developed to handle their silt and process wastes. The silt ponds necessitate dredging, and the dredge material is used to build up the dikes.

Waste paper is the next largest item generated by the industry and is disposed of either by company employees in the company boiler or by private collectors to an external land disposal site. In excess of 200 tons of waste metals per year are generated and disposal is by sale to a scrap iron dealer approximately once a year. The dealers take possession of the materials at the plant site and load it from the company's "bone yard". This facility usually incorporates the aspects of a permanent dump site for miscellaneous materials including wood and other demolition and construction materials (see Appendix C).

The hazardous waste potential of the industry includes caustic barrels, which are washed prior to being hauled away by the refuse collection people (Appendix D).

Survey Group 8
BEVERAGES
SIC Number 208

The beverage industry manufactures and wholesales soft drinks and is the jobber for canned soft drinks which are shipped into the state. The industry is distributed throughout the state--especially in the population centers. The business hits the high cycle during the summer months. The waste streams from these companies consist primarily of paper, glass, syrup cans or jugs, and wood. Syrup for the more popular beverages is received in returnable containers. Use of standard commercial refuse bins and 55 gallon barrels is the usual method of solid waste storage. Frequency of collection of solid wastes range from 1 to 5 times per week. A little over half of the companies employed contract solid waste collectors. The balance hauled their own wastes. In all cases, disposal was at a community solid waste disposal site which was generally a landfill.

Very little capital cost was incurred in solid waste management. For example, barrels used for storage of solid wastes were barrels which contained cleaning wastes and vehicles used in waste transport were generally company vehicles. The internal cost of handling solid waste, including such things as labor and equipment use, ranged from approximately $210 to $1,875 per year. This cost was derived from an estimate of the time spent on in-plant labor for gathering of waste materials, rather than the transportation and

disposal practices of the company. The external cost for landfill fees and contract collectors ranged from nothing to $360 per year. Those firms which received a complete collection and disposal service paid an average of $225 per year for the service.

Hazardous wastes are not a serious problem with the beverage industry. The only qualifying material is the caustic bottle wash which, when changed, is diluted and routed to the city sewer. The average company uses approximately twenty 55-gallon barrels of caustic per year to replace and keep the strength up in the bottle washer. The drums are washed and salvaged for other uses--usually trash barrels--or returned to the supplier for reuse (see average company statistics in Appendices C and D).

Survey Group 9
MISCELLANEOUS FOOD
SIC Number 209

The surveyed portion of the miscellaneous food industry in Idaho included five firms that produced potato chips, honey, ice, cider, and vinegar. The plants were all located in southern Idaho, employed a maximum of 75 production workers, and varied from somewhat seasonal to highly seasonal.

The waste materials generated by these plants were food process waste, paper, mixed plant trash, wood, glass, diatamacious earth, and a trace of plastics.

The food process waste amounted to approximately 525 tons and included waste potatoes and potato chips which were stored in barrels and hauled from the plants on a daily or weekly basis by farmers for swine feed. Also included in the waste was some honey, which was delivered by the company to the city solid waste disposal site, and apple pulp which was removed by cattle feeders.

The paper generated by the firms was stored in a variety of ways, including the use of bulk commercial refuse containers, trucks, and boxes and piles. The companies generally have their own collection service and deliver the material to a community sanitary landfill--except that which is burned in a boiler--and some cardboard boxes, which are given away for reuse. Those companies

generating wood handled it in the same manner as their paper waste, and it was all delivered to a sanitary landfill. Diatamacious earth used as a filter for food products amounted to less than 10 tons and was all delivered by the company to a community disposal site.

The mixed plant trash, glass, and a trace of plastic was all managed in about the same manner as the paper and were disposed of at the community disposal sites. (Appendix C contains more detailed solid waste handling data).

The hazardous waste potential of this industry would include the barrels from the caustic cleaning compounds. These containers are delivered to the local community solid waste disposal site (Appendix D).

Survey Group 10
TEXTILE KNITTING MILLS
SIC Number 225

Idaho's only textile knitting mill is south centrally located and is the lone member of Survey Group 10. The manufacturing process is continuous with little or no seasonal fluctuation.

The primary solid waste streams are textiles, paper and wood, followed by metal and spent lubricating oils. The textile, paper, and wood wastes are stored in bulk containers with a private contractor providing the daily collection and transportation to a county owned sanitary landfill. The metal and oil wastes are recycled or reused. Both are stored in 55 gallon barrels with the metal collected by a metal salvage firm. The oil is given away for reuse in local agricultural operations.

This industry does not dispose of any hazardous waste, and the only containers discarded are those which contained dye and cleaning solutions. The containers are aged before the larger barrels are salvaged, and the smaller containers are collected with ultimate disposal at a sanitary landfill.

Considering the size of the establishment, the solid waste stream is not extremely large. External solid waste expenditures are directly proportional to the amount generated, and these figures are also moderate. There are also some internal costs accrued in

transporting the solid waste from the generation point to the bulk containers. Since only one company is included in this industrial group, there are no solid waste volumes in Appendix C.

Recycling is practiced whenever possible. However, due to technological and marketing limitations, metal is the only material currently recycled.

Survey Group 11
CANVAS AND TEXTILE SHOPS
SIC Number 239

Survey Group 11 is comprised entirely of those industries involved in manufacturing miscellaneous fabricated textile products. Canvas shops are included in this group and are located primarily in the southern half of the state due to their association with agricultural operations. Drapery shops are centered near municipalities and are scattered throughout the state. Canvas shop operations tend to vary with the agricultural season while drapery shops operate year around.

Textile and paper solid waste streams are approximately the same size and constitute the major portion of solid waste generated by this industrial group. Trace amounts of soil are also collected, resulting from the repair of used and dirty canvas irrigation dams. The small average size of these establishments result in relatively small volumes of solid waste which are usually stored in 32 gallon galvanized cans. Private contractors perform the collection services in most cases. Ultimate disposal is performed at city or county owned sanitary landfills or dumps. Some companies do incinerate paper, and a small minority also perform their own collection service. These same companies also utilize municipal or county solid waste disposal sites (Appendix C). Textile salvaging is practiced on a limited scale by donating usable scraps to social groups and clubs. There are no hazardous wastes generated by this group.

Expenditures for solid waste processing, collection and disposal are low, primarily because of the commercial nature of the businesses and the relatively small volumes of waste generated.

The solid waste streams produced by this industrial group are not well adapted to recycling because of the type of waste and the relatively small amounts generated.

TIMBER RESOURCES

	Survey Group	SIC Number
Sawmills and Planing Mills	12	242
Plywood and Veneer Plants	13	2432
Pole and Miscellaneous Wood Products	14	249

Idaho has 21.8 million acres of forest--15.8 million acres of which are classified as commercial forest, divided equally north and south of the Salmon River. Twenty percent of the commercial forests are in private holdings. The balance is controlled by Federal and State government.

Northern Idaho has the greatest concentration of mills and the largest total output of forest products. This is due to a variety of reasons which include a longer industrial history and a more intensive use and greater productivity of the timber resource.

This industry includes saw and planing mills, plywood and veneer plants, particle board plants, utility pole yards, and special product sawmills. Waste generated at the plants is comprised primarily of wood (to be explained in more detail later), ash, yard debris, scrap metals, paper, used oil, septic tank and lagoon residue, cafeteria waste, and a trace of rubber and glass.

In the milling of timber, as high as 50% by volume is lost to some form of waste which may or may not be recovered as by-products. The avenues of recovery of this material include use of wood fuel

boilers to operate mills and kilns, chipping of slab wood, and the transportation and sale to a particle board mill, the processing of bark into decorator bark and soil mulch, and the use of sawdust shavings and bark as a bedding material for livestock.

Depending on the number of wood waste, utilization methods practiced and the interrelating economic factors of utilization or disposal, the opinion of the plant manager can be that he has an actual shortage of waste materials on which to operate the plant, or that he has a very expensive problem on hand that has yet to be solved. The determination of what is waste and what is a by-product depends to a large degree on securing a market, the logistics of getting the material to the market, and quality control of the products.

Although some bark is used as decoration, soil mulch, bedding, and mixed with other wood waste for boiler fuel, it is the type of wood waste which presents the most difficulties in utilization. It is often burned in a teepee burner which creates air pollution that is difficult to control.

Practices and systems employed by the sawmills always include a continuous flow of the "wood waste" from the point of generation via chain conveyors or pneumatic conveyor systems to a point where the "waste" can be: 1) reduced to chips or hog fuel, 2) stored for fuel, 3) routed to by-products, or 4) directed to disposal.

Investment in hardware for the systems employed can be easily offset by the sale of by-products.

The disposition of ashes from boilers, teepees, and on-site burners is the second largest waste handling job at the sawmills and is usually accomplished by the regular maintenance crew on a weekly basis on one of the down days. A front-end loader or fork lift truck with ash bucket is generally used, and the ashes are filled or spread on company property.

Yard debris is comprised of wood, mud, rock, and bark that comes from the log storage yard and is cleaned up with a loader and re-deposited in an area that needs fill.

The office paper and combustible maintenance shop waste is usually thrown in the conveyor to the burner or boiler and disposed of in this manner. Scrap metals are put into a scrap pile and are usually sold once or twice a year to scrap dealers who take possession of it at the mill site.

Septic residues are generated at a few plants from both domestic sewage and plywood and veneer processes. This material is pumped by commercial septic tank pumpers and disposed of according to the pumpers' waste discharge permit.

A small amount of rubber waste is generated in the form of used tires which are either returned to tire dealers or disposed of in

the company fill. Oil from changing the oil in equipment is collected and put to secondary uses (such as oiling down gravel roads) or is given away. Other items in small amounts are disposed of in the company fill. Only two of the surveyed companies used a community solid waste disposal site. One subscribed to a city solid waste collection service for the company cafeteria wastes. The other self-hauled a truck load a day of mixed yard debris, maintenance trash, and office waste to a community disposal site.

The utility pole yards and special products sawmills require a separate explanation under this section in that they deal primarily in cedar. The utility pole yards have very rigid requirements in grading their products and are interested in long straight solid poles from which they peel off the bark and treat the poles with a penta solution. One pole will yield approximately one cubic yard of bark. There is a definite trend to abandon teepee burning of this material and haul it to a landfill or use it for livestock bedding because it is probably the most difficult wood waste to burn while staying within the air pollution control requirements.

The special products sawmills also deal almost exclusively in cedar and make shingles, shakes, stakes, post, and rails. These mills are very small (1 to 10 employees), and many of the listed firms have gone out of business or ceased operation since the completion of the clean-up effort behind the Trapper Creek fire of

several years ago in northern Idaho. The remaining mills are finding it more difficult to obtain a supply of cedar, and production is lagging.

Wastes generated at these mills, in addition to the bark, are sawdust from the cutting of shingles and shakes and slivers of wood, knots, and rot that will not split out into product. Estimates of the quantity of waste generated do not run over several tons a day during operation at any of the mills, and disposal is via small boilers, teepees, and a small amount of on-site open burning of yard debris.

Additional recovery and reuse of the wood resources look promising when you assess the technical development of new products and systems of the past decade and the current research. These developments and the research include laboratory produced bark board (bark sandwiched between particle board), cement board (a mixture of cement and wood chips), and possibly a pilot scale fluidized bed incinerator for on-site incineration and power generation.

Appendices C and D contain more detailed information on solid waste practices and hazardous waste materials.

*"Timber Resources of Idaho"

Survey Group 15
MILLWORK PLANTS
SIC Number 2431

Twenty-three plants, in which the primary input product is lumber and which are generally considered in the millwork category, were surveyed. These plants are scattered throughout the state with the greatest concentrations in the Boise area. They produce such items as: moldings, sash, trim, cabinet parts, cut stock for furniture and toys, cabinets and vanities for both home and commercial use, doors, truises, joists, flooring, boxes, laminated beams, custom planing, pallets, and do custom repairs on boats and other structures.

This industry, which employs 706 production workers, produces waste types and amounts of the same character and rate as one medium size sawmill. The generation of waste at the millwork plants consist primarily of wood, including sawdust, shavings and cutoffs, paper, mixed refuse, string, and ferrous metals.

Most of the wood waste is recycled or reused for particle board, cattle bedding, kindling firewood, and gardening. However, some does make its way to community solid waste disposal sites. Handling and storage of the wood waste usually includes some sort of pneumatic collection system and bins, hoppers, or piles for storage (see Appendix C).

Other waste is stored in bulk boxes, cans, barrels and piles, and is collected and transported mainly by company employers and equipment to community disposal sites with a few companies subscribing to a regular collection service.

The heavy metals are sold to private salvage companies, and the light metals such as sheet metal and banding are delivered to solid waste disposal sites.

Annual cost of waste handling and disposal ranges between $20 and $8,500 with an average cost of $1,535. Additional recycling is possible on a limited scale, and several of the medium-size operations mentioned that their cut-offs should be used to make particle board.

Hazardous waste materials are limited to glue washings and related products (Appendix D).

Survey Group 16
CABINET AND FURNITURE SHOPS
SIC Number 25

The furniture and fixtures industry manufactures mattresses and bedsprings; upholstered and unfinished household furniture; curtains, drapes, awnings, venetian blinds, and window shade lath; cabinets, vanities, shelves, partitions, and counters, etc. for home, office, and store; church furniture; and performs a variety of custom repair jobs which include reupholstery, boat and camper repair, and formica work.

The majority of the furniture and fixture firms are located in southern and southwestern Idaho, with a few firms in other areas of the state.

Thirteen companies, employing 283 production workers, were surveyed. The two largest firms employed 70% of the production workers and were in the mattress, upholstered furniture, and curtain and drapery fraction of the industry. A portion of their business, along with the cabinet makers in this industry, is to supply the mobile home and camper industries of southwest Idaho.

The waste materials generated by this industry in their decreasing order of magnitude are: wood, mixed refuse, textiles, paper products. [Mixed refuse includes wood, textiles, cardboard, ferrous metals, plastics (laminates), cafeteria waste, non-ferrous metals, and glass). Storage methods include trailers, standard

commercial refuse bins, galvanized cans, barrels, cotton bale sack, and piles (see Appendix C).

Collection and delivery of waste materials to community solid waste disposal sites is performed by commercial refuse haulers at 7 firms, by the company at 4 firms, and by individuals hauling on a part time basis at 2 firms.

Salvage metals are delivered to the salvage dealers by the company. The wood which is salvaged for bedding or kindling is hauled away by the person who will be using it, and the balance of the wood is placed with the plant trash or is hauled to disposal by the company.

A small amount of upholstery fabric, trim, and bolt ends are salvaged by one firm and given to the Salvation Army. Another firm has a large amount of surplus foam which they bale and sell as a by-product.

Except for the materials salvaged, disposal is at the local community solid waste disposal site with only one firm using an enclosure to burn part of their waste. The firms are primarily located in the larger communities that are operating sanitary landfills.

Hazardous waste potential is low, and the only qualifying agents would be the containers from the contact bond cement and some paint and varnish containers which, when emptied, are put in the regular plant trash (Appendix D).

Survey Group 17
PULP AND PAPERBOARD MILLS
SIC Number 262 & 263

Survey Group 17 is composed of paper and paperboard mills. Idaho's only paper mill is located in Lewiston with easy access to the Snake River transportation route. Operation is year around with little or no seasonal fluctuation.

Water treatment sludge, paper, wood, inorganic chemicals and ferrous metals are the major solid waste streams. Smaller volumes of cafeteria waste, soil and ashes, glass and non-ferrous metals are also generated. Due to the large volumes, storage is primarily accomplished by utilizing bulk containers or an open pile. The majority of collection and disposal operations are performed by company employees with ultimate disposal on company property. All burnables, including the water treatment sludge, are incinerated prior to their ultimate disposal. The large inorganic chemical stream, consisting mostly of impurities, appears to be the major solid waste problem. This waste material is also disposed of on company property. Ferrous and non-ferrous metals are recycled or salvaged, and the rubber from old tires is returned to the tire firm. Since this group is composed of only one Idaho firm, its specific waste stream data is not included in Appendix C.

Biocides (biological disinfectants) are considered a hazardous waste and are consumed in the operation of the plant. Some of the

55 gallon drums, which contained the biocides, are collected by a private individual after the containers are washed out (Appendix D).

Solid waste processing costs are quite high due to the large amount of solid waste which must be removed from effluent air and water streams. The magnitude and nature of the solid waste streams are also reflected in the high storage, collection, and disposal costs.

Internal plant recycling is practiced whenever possible. The major solid waste streams are impurities or process by-products which cannot be utilized.

Due to the extreme toxicity of some biocides, correct management practices of the materials and containers is essential.

Survey Group 18
PAPERBOARD AND PLASTIC CONTAINERS
SIC Number 265

Survey Group 18 contains those industries who manufacture paperboard products and paperboard containers from purchased paper. The industries comprising this group are located primarily in the southern portion of the state, near the agricultural centers. Operation does not fluctuate seasonally.

Paper, paperboard and plastics are the major solid waste streams. The component materials of the manufactured container indicates which of the above is the primary waste stream for a given company. Some wood waste is also generated, since wood is used to reinforce large containers. Large bulk containers are used for intermediate storage almost exclusively. Private contractors provide the weekly or bi-weekly solid waste collection services with the ultimate disposal at county or municipal sanitary landfills or dumps. Whenever it is economically practical, paper baling and recycling is practiced. Because of the limited number of companies in this survey group, there are no average figures entered in Appendix C.

Acetone wastes are limited to those companies manufacturing plastic-coated containers. The acetone is bought in returnable bulk containers and is sewered after dilution with water.

The only internal expenditures for solid waste handling are labor costs to process the material and deposit it in the bulk containers.

External handling constitutes the major solid waste expense and is proportional to the amount of solid waste generated.

The large volume of the paperboard wastes appears to be the only solid waste problem. Development of economically feasible recycling markets would greatly reduce the volume of material now being discarded, with the exception of the plastic-coated cardboard or paperboard, which is not recyclable at this time.

Survey Group 19
PRINTING AND PUBLISHING
SIC Number 27

Survey Group 19 is comprised of the printing and publishing industries in SIC major group 27. These industries are dispersed uniformly throughout the state with the size of each establishment varying directly with the population of the community or area which it serves. Operation is continuous with no seasonal slowdown.

Paper is the primary solid waste with the amount generated being directly dependent on the volume of the product stream. Ferrous and non-ferrous metals and trace amounts of ink are also generated in the form of empty liquid containers. The method of storage is a function of the size of the establishment and varies from waste baskets to bulk containers. In most all cases, external solid waste handlers provide the collection services which vary in frequency from weekly to daily. The only exceptions are those establishments in rural areas which utilize incinerators and burn barrels. Most of the companies in this group use the municipal or county sanitary landfill or dump for the ultimate disposal of the generated solid waste. Some recycling of ferrous and non-ferrous metals is practiced.

The only waste materials generated which might be considered hazardous are solvents, cleaners, and, in some cases, photo-engraving acids. The materials themselves are consumed in the process with

most of the containers being disposed of in municipal or county-owned disposal sites (Appendix D).

Since, in most cases, external solid waste handlers provide the collection and disposal services, the costs are directly proportional to the amount collected and vary from $30 a month to over $200 a month.

Appendix C contains solid waste practices and generated volumes of a pseudo-average company of the survey group.

There appears to be no major solid waste problems associated with companies in this group, primarily because of the non-putrescible, non-odiferous nature of waste paper products. Paper recycling is not practiced on a large scale at this time, primarily because of the shortage or absence of markets within an economically feasible distance.

Survey Group 20
CHEMICALS
SIC Number 28

Those establishments manufacturing chemicals and allied products (SIC major group 28) constitute Survey Group 20. Idaho's industries in this group are those producing inorganic chemicals, soaps, paints, and agricultural chemicals. These establishments are located primarily in the southern part of the state and employ over 1,000 employees in year around production.

The industries are divided into two distinct groups: those performing a physical or blending process, and those utilizing an actual chemical reaction. The companies involved in the physical or blending process tend to have much less inorganic or organic chemical wastes than those involved with chemical reactions.

Most of the inorganic and organic chemical waste streams generated are disposed of on company property by landfilling, stockpiling, or lagooning. These waste products are sold whenever possible, but the market is quite limited. Some furnace slag material is currently being sold as a substitute for natural aggregate. Company employees perform the processing, collection, and disposal services. Storage of wastes primarily in open piles and ponds is used because of the large volumes handled.

Paper and wood solid wastes are generated in an amount proportional to the size of each establishment. Company employees perform

the paper and wood waste handling with ultimate disposal at company owned landfills or dumps. Some incineration is also practiced with ultimate disposal of the residue at company owned sites. A few of the smaller companies utilize private contractor collection services for all wastes, with ultimate disposal at municipally or county owned sanitary landfills or dumps. See Appendix C for the solid waste figures of a pseudo average plant.

The agricultural chemical companies have substantial quantities of pesticides and pesticide containers which are disposed of on company property or at external solid waste disposal sites. Pesticide manufacturers utilize complete and comprehensive solid waste management techniques for containers and material. Smaller pesticide companies and distributors have a container disposal problem, since the containers generally are not treated prior to disposal at a public disposal site(s). Other chemical manufacturing companies dispose of a phosphorous contaminated metal in company owned landfills (see Appendix D).

Ferrous and non-ferrous metals are recycled by selling them to private contractors engaged in salvage operations. This additional source of income helps to offset the high disposal costs experienced by some companies.

Solid waste expenditures are quite high for some companies, primarily due to the large volumes of solid waste generated. For

these companies, the expenditures are internal and originate from wages and other operational costs. Those companies utilizing municipal or county sanitary landfills in conjunction with private contractor collection are not plagued with excessive volumes of waste and the costs are, therefore, much lower.

Recycling is practiced both within the plant and externally, whenever feasible. Many of the solid waste materials discarded have no market value or use. Therefore, the large volumes of materials generated must be discarded until technology can develop new uses for these solid wastes.

Survey Group 21
MISCELLANEOUS PLASTIC PRODUCTS
SIC Number 307

The plastic industry in Idaho is small. Five of the plastic businesses surveyed employed approximately 43 production workers and produced approximately 200 tons of solid waste. Products produced by these companies include such items as: polyethylene water pipe, fiberglass reinforced bathtubs, shower stalls, sinks, sheets, pickup truck canopy covers, various accessories, vinyl and plywood laminated wallboard and extruded and vacuum-formed siding and sheets.

The plants are concentrated in Ada and Canyon Counties with only one outside of that area in Kootenai County.

Waste materials generated include plastics from trim and overspray, paper from packaging and office, wood from pallets and panel trim, some polyvinyl acetate, 55 gallon drums, a very small amount of ferrous metal, and a little cafeteria waste.

Storage of waste is accomplished in a variety of ways which include: galvanized cans for cafeteria; both open and closed bulk containers; and 55 gallon drums for paper, wood, and plastic; and open piles for the same. Acetates are stored in 55 gallon drums.

Collection frequency for solid wastes ranged from daily, for the plant using a contract collector, to once per two weeks for those plants hauling their own wastes. One plant utilizes a contract

collector for that amount that can be stored in the prescribed containers. The rest is piled up and hauled by the company including the bulky, heavy, hard-to-handle and surplus materials.

Almost all of the solid waste material is disposed of at a community sanitary landfill, with only minor portions going to landfills of lesser nature, burned in barrels, and salvaged. No hazardous wastes were reported by this survey group.

In-plant recycling of polyethylene plastic is practiced. Out plant recycling is not practiced for two reasons:

1. Machinery is needed to clean contaminated material.
2. The national sanitation foundation seal on food or drink surfaces requires virgin or in-plant recycled materials only.

From a nominal amount to as high as one-eighth of the production labor is spent in the clean up, storage, and disposal of waste materials. (see Appendix C).

Survey Group 22
LEATHER PRODUCTS
SIC Number 31

The leather industry in Idaho is very small, employing less than 35 production workers. There are no tanneries, and the industry is confined to the manufacturing and processing of gloves, saddles, bridles, chaps, straps, belts, hobbles, halters, and embossing of leather goods.

The production of gloves is on a production line basis, but the balance of the industry consists of small shops usually associated with a retail outlet in the same building. Items are usually produced on a custom order basis or to replace store stock.

The waste streams from these businesses are paper from packaging, leather trim, a little wood from shaping the saddle truss, and a very small amount of metallic and non-metallic material from unusable snaps, buckles, rings and garmets. Typically, the small shops will not have over a hundred pounds a week of waste materials, and it is contained in a refuse can or cardboard box and set in the alley for collection by the city's contract refuse hauler. The larger glove manufacturer generates in the neighborhood of 10 cubic yards of solid waste per year per employee. The waste is composed of equal parts of paper and leather and is stored in a standard refuse bin that is collected by one of the few municipally owned and operated collection systems. Disposal in all cases is accomplished at the

communities' solid waste disposal site. A small amount of salvaging is practiced and, in one case, a shop operator gives leather scraps to a boy scout troop which uses it for arts and crafts sessions. See Appendix C for additional solid waste practices.

There were no apparent hazardous materials in the waste stream of this industry because of the small volume of waste material which is managed through the community system. There are no specific significant industrial solid waste problems associated with this type of business.

Survey Group 23
STONE, CLAY AND CONCRETE PRODUCTS
SIC Number 32

Survey Group 23 consists of those companies in SIC major group 32 and includes companies engaged in manufacturing stone, clay, and concrete products. Ready-mix concrete companies are the most numerous of this industrial group, followed by brick manufacturers, ceramic shops, and a cement manufacturer. As a group, it appears to be evenly distributed throughout the state. Year around operation is practiced by most of the companies, with the exception of the cement manufacturer and the ready-mix operations in colder regions of the state.

Soil and stone are the major solid wastes generated. These materials are easily disposed of because of their natural non-offensive state. An open pile is the primary method of storage, and company employees are usually responsible for landfilling the materials on company property. The paper solid waste stream is also quite high, primarily because much of the raw materials for many of these companies are received in paper bags. The volume of paper is reduced by combustion in an incinerator or open pile with ultimate disposal of the residue on company property. A minority of companies do not incinerate. These companies dispose of the paper in company or county-owned sanitary landfills or dumps. Most of the ferrous metals are recycled by salvage contractors who also perform the collection services. Appendix C contains solid waste data for this group.

A dilute acidic cleaning solution is used in some of the operations to clean equipment. The small amount of cleaning solution used (usually not considered a hazardous waste) is allowed to drain onto company property with the containers disposed of in company or county-owned sanitary landfills or dumps. (Appendix D)

Solid waste expenses are usually expressed in the form of company man-hours spent in processing, storage, collection, and disposal. The expenses are relatively low because of the non-offensive nature of a large part of the overall solid waste stream.

Land disposal of the "soil type" solid waste is a form of recycling, since the raw materials were directly derived from the land. The only solid waste practice which might deserve further attention is the incineration of the paper wastes. Compliance with future air pollution laws might require an improved incinerator in some cases.

Survey Group 24
FOUNDRIES AND SMELTERS
SIC Number 33

Ferrous and non-ferrous foundries and lead and zinc smelters are the primary metal industries comprising Survey Group 24.

The smelter industries are located in the northern ore-rich section of the state, and the foundries appear to be located primarily in southern Idaho. All the primary metal industries operate 52 weeks per year with little or no seasonal slowdown.

Slag, the impurities resulting from melting the metal ore (smelters) or from melting the metal for casting (foundries) is the primary solid waste. As would be expected, the amount of slag generated is directly proportional to the amount of ore or metal melted down. Company employees perform the solid waste handling at the smelters, primarily because of the large volume of slag produced. The slag or impurities are disposed of on company property in an open pile or as settlings in a lagoon. In the future, certain percentages of the slag material is to be crushed and sold for use in sand blast operations. The ferrous and non-ferrous foundries handle a much smaller volume. It is used as an all weather road covering or disposed of at the county or municipal landfills.

Ferrous metals are also generated and salvaged. This is usually in the form of worn out equipment, which is collected and salvaged by a private contractor. The smaller amounts of paper and wood which

are generated are disposed of in county or municipally owned sanitary landfills or dumps. Appendix C does not contain any data for this group because of the small number of companies involved.

There are no hazardous wastes or containers reported for this group. The heavy metal and acid wastes produced by the smelter operation must not be included because they are discharged in the effluent water stream.

Both internal and external expenditures for solid waste management are directly proportional to the amount of solid waste generated, and range from less than $30 to over $200,000.

Internal plant recycling and external recycling is practiced whenever possible. The waste streams are merely impurities or useless by-products of the process. Technological breakthroughs in conjunction with economically feasible markets are necessary before recycling can be practiced on a large scale.

Survey Group 25
FABRICATED METAL PRODUCTS
SIC Number 34

The fabricated metal products industry is dispersed throughout the state with the major concentration of companies in the Treasure Valley area. A total of 22 companies that employ approximately 404 production workers were surveyed. This industry in Idaho produces such items as metal food containers (cans), farm and home fuel tanks, water tanks for camp trailers, metal doors and windows, aluminum siphon tubes for irrigation, vacuum caps, ventilation covers, steel culverts, food processing equipment, steel ramps, brackets, metal plating of auto bumpers, electronic parts, and screw machine products. Most of the sheet metal and structural steel portions of this industry are on a custom-job-order basis.

Waste materials generated at these firms include ferrous and non-ferrous metals which are sold to local scrap dealers or packaged and returned in quantities to the primary manufacturer at better than local prices. Galvanized sheet metal, which is not salvaged, paper cardboard, wood, metal bonding, metal shavings, a little burlap, sweepings, ashes, sulfuric acid, caustic soda, copper sulfate, and chromic acid are also generated (see Appendices C and D).

Storage of waste metals is often in a large metal box provided by the local salvage dealer or in a company owned waste metal box. However, larger pieces of metal which may be salvaged internally are returned to stock or to a scrap iron pile. Some of the more expensive metals (stainless, aluminum, copper) are often stored in 55 gallon or

smaller barrels and boxes. One particular manufacturing firm hand packs aluminum scrap in cardboard boxes and palletizes them for storage and returns them in carload lots to the manufacturer. The plant trash, which includes the galvanized metal scrap, is stored in conventional manner of small open containers in the work area and then carried out by hand and dumped in refuse bins or barrels which are serviced either by company employees or the community's contract solid waste collector. Chemicals are mostly neutralized and diluted and routed to the sewer or contained in 55 gallon barrels and hauled by the company to the community solid waste disposal site.

All waste is transported to and disposed of at a community disposal site. Exceptions are salvaged materials and a small amount of metal shavings and floor sweepings which are just pushed out into the dirt, and a portion of the chemicals which are sewered.

Survey Group 26
MACHINERY AND MACHINE SHOPS
SIC Number 35

Twenty-five firms that employ two hundred forty production workers were surveyed in the machinery group in Idaho.

Most of the firms in this category started business as general welding or general machine shops and still retain this character as much of their business is repair work. Over the years, many have developed specialties and hold patents on their developments and manufacture equipment involving their patents. Usually there is a custom order or potential purchaser before manufacturing is started.

The machinery firms rely upon agriculture, food processing, forestry, construction, transportation, and other Idaho industries for the sale of their products and services.

Waste materials generated by this industry are as follow: ferrous metals in the form of shavings and scraps, paper, mixed shop waste, wood, ash, rubber, non-ferrous metals, and grease rags (see Appendix C).

Iron scrap metals of any consequence are usually stored in a scrap pile and are either delivered by the company to a scrap iron dealer or sold on-site to a dealer once or twice a year. Non-ferrous metals are handled in about the same manner except that storage is mainly in containers (barrels, boxes, cans) to keep it separated for salvage.

Metal shavings, light sheet metal, and unmarketable metals are contained in and disposed of with the general shop waste. The paper,

wood, mixed shop and miscellaneous waste are stored in a variety of ways including piles, bulk bins, galvanized cans, barrels, trailers, and boxes.

Collection frequency of the above material ranges from once per year to almost daily. Generally speaking, the higher frequency of collection and contained storage is associated with the nine firms that engage commercial refuse collectors to haul their waste materials.

A number of practices are used to dispose of the various waste materials. Some of the combustible waste materials are incinerated in on-site "incinerators", burned in stoves, burn barrels, and burned openly. Ash is disposed of by dumping on company property. A number of items, such as metal shavings and some paper, is dumped or filled on company property. All firms have waste materials which are delivered to the local community solid waste disposal site on a regular or periodic basis.

The hazardous waste potential includes acid metal descaler used to clean potato digger rods. The material is contained in a dip vat for use, but is changed several times per year. The old solution is contained in barrels and delivered to a community disposal site by company employees. A certain amount of paint thinner and other solvents are used by the firms. These containers are put with the general plant trash and used solvents are usually spread into the ground around the shop (Appendix D).

Survey Group 27
ELECTRICAL EQUIPMENT
SIC Number 36

Survey Group 27 is made up of those industries producing electrical or electronic machinery and equipment. These industries are predominately located in the northern section of the state, but are als found in other areas. These industries do not, as a rule, employ large numbers in their year around operation.

The precise nature of the manufacturing practiced by this group is reflected by the small amounts of plastic and metal wastes generated. In most cases, the paper wastes from packaging materials are larger or on the same order of magnitude as the plastic and metal wastes. Ultimate disposal of most of these wastes is at municipal or county-owned landfills or dumps. The collection service appears to be equally divided between company employees and private contractors. Since the generated volumes are relatively small, storage is primarily in galvanized cans. Some of the larger companies utilize incinerators for the paper wastes. The residue is disposed of at county or municipal disposal sites. See Appendix C for waste data of a pseudo-average company of Survey Group 27.

Hazardous acid, caustic and cyanide solutions are chemically neutralized or diluted prior to disposal on company property or sewered. Most companies sewer the waste chemicals after neutralization. Containers are also washed out or neutralized prior to disposal in county or municipal sanitary landfills or dumps (Appendix D).

Capital expenditures for solid waste processes are relatively high for those companies that generate large amounts of the hazardous wastes which require neutralization. Collection, storage and disposal costs for all other materials are relatively low because of the small volumes generated.

Opportunities for recycling are not common because of the small solid waste streams characteristic of most of the companies in this industrial group. Some of the larger companies recycle ferrous and non-ferrous metals if the generation is large enough to support salvaging operations. It appears that hazardous waste handling by most of the companies in this group is quite satisfactory. Because of the toxicity of some of the material, adequate neutralization and correct solid waste handling techniques are essential.

Survey Group 28
TRANSPORTATION EQUIPMENT
SIC Number 37

In Idaho this group includes those firms whose primary business is fabricating bus bodies, truck trailers, and horse trailers, aircraft (balloons), boat building and repair, travel trailers, and campers.

With the exception of travel trailers and campers, the businesses classified as transportation equipment manufacturers are so few and small (only 39 production employees in the surveyed portion of the industry) that the firms could easily be mistaken for other types of industry and commercial business firms such as machine shops, blacksmith shops, and metal fabrication shops. In fact, the other non-transportation type businesses probably do produce more transportation products than the classified industry.

The waste generated includes paper, wood, cans, fiberglass, ashes, aluminum, and some sand and muck (see Appendix C). The sand and muck is generated primarily on repair jobs to boats (sandblasting) and trailer trucks (road dirt, manure, and ice in winter).

The travel trailer and camper business is considerably larger, and there were 253 production workers in the surveyed portion of the industry.

Waste generated by this industry includes scrap wood and sawdust, paper, wire, aluminum and plastic siding, and traces of other components such as carpeting, fabrics, nails, staples, etc.

Storage of waste materials in the transportation industry is primarily in bulk, utilizing fork lift bins, regular commercial refuse bins, trailers, open piles, some cans and barrels, and, in one case, a semi-trailer compactor unit.

Collection and transportation of the solid waste is accomplished by the company in 66% of the cases using pickup trucks or large trailers. The private contractors servicing the balance of the industry use regular compactor trucks or tilt bed stake trucks with hydraulic hoists.

Disposal is mostly at city or county-owned disposal sites. However, one company does burn its solid wastes and spreads the ashes on-site. The metals are salvaged and sold in bits and pieces to individuals who want them for a particular job, but the bulk of the salvage is sold to scrap metal dealers. One of the recreational vehicle manufacturers does recycle and reuse additional items such as plastic and some shipping containers and devices by shipping these materials as back-haul on company supply trucks to the company's central supply depot.

Potentially hazardous materials found in this industry were containers which had contained acetone and M.E.K.-Peroxide. There were approximately 100, one-gallon relatively incongruous containers that were managed along with the regular plant trash. The 55 gallon barrels are returned to the manufacturer (Appendix D).

Survey Group 29
PREBUILT HOMES, MOBILE HOMES
SIC Number 37

This group is now SIC 37. Prior to the SIC code reclassification, it was SIC 3791 and 2433 and included the building of mobile homes, whole, and modular prebuilt homes in Idaho. The industry is centered in the southwest portion of the state around Boise, Nampa, Caldwell, and Payette. A few plants are scattered in northern and eastern Idaho. Ten surveyed companies, employing 953 production workers, manufacture prebuilt homes or mobile homes. Waste generation is high and averages 8,000 cubic yards per year per plant with an average annual handling and disposal cost of $15,000. The waste generated is high in wood including sawdust, small cut-offs and thin strips of studs, particle boards, plywood, and paneling (see Appendix C). The larger pieces of wood, plywood, and paneling are internally salvaged for use as reinforcement pieces in and around windows, doors, corners, and roof trusses. Cardboard and paper packaging from the many supplies that go into the building of the homes is the second most abundant waste. There is also some waste from carpeting, wall board, and other finishing work. Metals in the form of wiring, window frames, roofing, and siding are saved and sold for salvage to local dealers. One large national company returns its metal and plastic salvage and some of the appliance and supply shipping boxes, door blocks, and the like. They are hauled back to the company supply depot on the supply trucks, and some credit is given on supply orders for these items which are salvaged or reused.

Various methods of storage are used. They include large trailers with a tilt bed or drop side which are spotted around the plant at heavy generation points, plywood boxes designed to be carried and dumped by the company forklift truck, regular commercial refuse bins, and, at small operations, cans and drums. The main storage system is usually supplemented by waste cans or cardboard boxes in individual work areas. These are hand-carried to the main system. Siding is normally stored in large metal forklift boxes, usually supplied by the salvage company, and small bits of copper wire and other small metal pieces are stored in 55 gallon or smaller drums.

Most companies provide their own collection service and employ up to two people to gather and haul waste material. If disposal sites are within several miles, the company will usually use trailers and a farm tractor, or up to a one-ton truck to tow the trailers. If the distance is much greater, the material is transferred via forklift dump boxes to stake bed trucks and hauled in this manner. Three companies do contract for solid waste collection service, of which two use regular city collection service provided by the city's contract collector. The other one uses an independent trucker who is assisted in loading by the night security men.

Disposal is at community disposal sites provided by cities and counties--most of which are sanitary or are attempts at a sanitary landfill. Only one company used on-site disposal which they were

converting from an open burning dump to a landfill to bring some of their property up to grade to use as additional parking area.

Potential for additional recycling and reuse of waste materials currently being disposed of is rather limited. There were no hazardous waste materials reported by this survey group.

Survey Group 30
MISCELLANEOUS MANUFACTURING
SIC Number 38 & 39

Included in Survey Group 30 are those industries manufacturing miscellaneous products not elsewhere classified (SIC major group 39). Idaho industries falling in this group are sporting good manufacturers, sign companies, those companies producing marking devices (stamps), and a dental equipment manufacturer (SIC 3843). The establishments surveyed are located principally in the southern half of the state and operate year around.

The different types of products manufactured by the establishments in this group are reflected in the diversity of the solid waste materials discarded. The primary solid wastes, in descending order of importance, are paper, wood, metals, plastic, and glass, Ultimate disposal is in county or municipal sanitary landfills or dumps. The only exception to this are some metals which are sold to private salvage companies. Approximately 80% of the companies utilize private contractor collection services with the remaining 20% performing the collection with company employees. The type of storage container depends on the amount of solid waste generated. However, galvanized cans are adequate for all but a few of the larger companies who utilize bulk containers.

Average solid waste data is not entirely descriptive of this group; however, those which are applicable are included in Appendix C.

Expenditures for solid waste management are predominately charges by external solid waste handlers and vary from under $20 per month to over $1,000 per month.

A small amount of sulfuric acid is disposed of on company property. However, this cannot be considered characteristic of the entire group because of the variety of manufacturing operations encompassed by this survey group (Appendix D).

The diversity and small volumes of solid waste generated make recycling extremely difficult. At this time, larger metal wastes are being recycled and that is all. As with all groups, the availability of dependable markets for other items would greatly enhance recycling.

CONCLUSIONS AND RECOMMENDATIONS

The increasing volume of solid waste is due principally to old habits at all levels of our society. This is a growing problem which will require the attention of all persons if a solution is to be found.

Industry operates on the profit motive basis. That is, in a given situation, the most economical of all possible alternatives is usually chosen. Solid waste management does not differ in this respect; the most economically acceptable method of solid waste management should be chosen.

Many of the companies surveyed spent an inadequate amount of time planning solid waste management operations. This, in itself, could increase solid waste handling cost above that of a well designed and managed system. A well designed solid waste management plan should incorporate revenue from whatever recycling is feasible, as well as set up a comparison of the costs of alternate solid waste management schemes. For example, a comprehensive solid waste management plan would compare costs of company collection vs. contracted collection and the costs of on-site disposal as compared to disposal at an external site. It must be recognized, however, that any company owned volume reduction or disposal operation should meet the state solid waste management regulations and standards. A well managed solid waste plan will also help project a progressive company image.

Many of the improper solid waste management practices encountered can be easily remedied. Others will require extensive development and study. A few of the areas in which improvement are needed are listed below:

1. Improper storage of solid waste was evident in many cases. This improper storage is not only aesthetically unpleasing, but also lessens the efficiency of the collection operation. Proper storage facilities should be designed for each application in order to achieve the maximum benefits from the available collection equipment.

2. Although current regulations prohibit the burning of most solid wastes, open burning of solid waste is currently practiced at many industrial establishments. In order to meet existing and future air pollution standards, more sophisticated incinerators will become necessary if burning is to be practiced.

3. The method most widely used for the ultimate disposal of solid wastes is land disposal. The method of disposal ranges from non-approved open burning dumps to sanitary landfill operations. Sub-standard, on-site, and externally owned land disposal sites constitute a major problem in the disposal of industrial solid waste. All disposal sites should be evaluated by the Department of Environmental and Community Services, and approval would be

either granted or denied depending on the characteristics of each specific site. The probability of ground water and surface water contamination and many other factors should be considered when selecting a solid waste land disposal site. The Department of Environmental and Community Services and related agencies will, upon request, provide technical assistance in locating a suitable site and in formulating an acceptable operating procedure.

4. Hazardous waste disposal is an item which demands correct management practices because of the obvious health hazards and environmental degradation which can occur if it is not managed properly. Whenever possible, the hazardous material and containers should be neutralized prior to disposal. In many instances, this is most easily accomplished by returning the containers or materials to the distributor or manufacturer. The small amounts of hazardous waste generated compound the problem by increasing the per-unit disposal costs.

5. Recycling and reuse of natural resources appear to be the only ultimate answer to the solid waste problem. Recycling, however, is complicated by many difficulties arising from industrial and governmental regulations and practices that favor the use of virgin materials. Incentives for recycling

would help promote recycling and reuse; achievement of these incentives should be strived for by all involved. Technological studies aimed at developing new and feasible recycling markets is a responsibility which should be mutually shared by industry, academia, and government.

6. Utilization of a company's industrial solid waste by other companies is currently practiced on a very limited scale. Increased communication between different companies might enhance this type of recycling and, at the same time, decrease raw material costs.

The only manner in which to insure the successful solution of the solid waste problem is through the mutual cooperation of the many peoples, industries, and agencies involved.

Appendix A

Industrial Survey Form

Idaho Department of Health
Environmental Improvement Division
Solid Waste Management & Vector Control Section
June, 1971
Industrial-Agricultural Solid Waste Survey

CHECK ONE:
Industrial Establishment ☐ Date of Interview ☐☐☐
Agricultural Establishment ☐ Interviewer No. ☐☐☐

State _____ County _____ City _____

3-Digit SIC ☐☐☐ Firm No. ☐☐ No. Firms ☐☐ No. Firms in Sample ☐☐

TIME FOR THIS INTERVIEW (HOURS):

DATE								TOTAL
OFFICE TIME								
FIELD TIME								

I. General Information

A. Identification of Establishment

1. Company Name _____

2. Name of Establishment _____

3. Mailing Address of Establishment:

_____
(Number) (Street)

_____
(City) (County) (State) (Zip Code)

4. Person Interviewed: _____
(Name)

_____
(Title)

_____
(Phone No.)

B. Industrial Classification

1. This establishment is a: Plant ☐ Farm ☐ Feedlot ☐ (Check one only)

2. Area occupied by this establishment: _____ Sq. Ft. OR _____ Acres

3. If establishment is a farm, give its cultivated acreage: _____ Acres

B. Industrial Classification (cont'd.)

4. Standard Industrial Classification

SIC Group No. (4-Digit)	SIC Group Name of Industry
(a) _____	(a) _____
(b) _____	(b) _____
(c) _____	(c) _____

C. Establishment Data

1. Normal Operating Schedule During 19____*:

(a) Hours/Day _____ (b) Days/Week _____ (c) Weeks/Year _____

If this establishment was included in the U.S. Census Bureau's 19____* Annual Survey of Manufactures, use the figures reported in that survey to complete items 2 and 3.

2. Number of Employees

(a) Number of production workers during pay period ended nearest the 12th of:

1) March, 19____*: _____ Production Workers

2) May, 19____*: _____ Production Workers

3) August, 19____*: _____ Production Workers

4) November, 19____*: _____ Production Workers

(b) All other employees, March 12, 19____*: _____ Other Employees

3. Plant Man-hours of Production Workers by Quarter:

(a) January through March, 19____*: _____ Man-hours

(b) April through June, 19____*: _____ Man-hours

(c) July through September, 19____*: _____ Man-hours

(d) October through December, 19____*: _____ Man-hours

---

* Enter last full calendar year.

II. GENERATION AND PROCESSING OF SOLID WASTES

Firm No. _____

A. Waste Types	B. Quantity of Waste Generated Annually						C. On-Site Waste Processing and Volume Reduction Methods (Check Methods Used)							
	Tons/yr	Cubic Yds/yr	Is This an Estimate of Waste Quantity?		Does Waste Generation Rate Fluctuate Seasonally?		Baling	Shredding or Grinding	Crushing	Composting	Incineration	Lagooning	Other (Specify)	None
			Yes	No	Yes	No								
1. Manure w/Bedding, Feed, Soil														
2. Animal Carcasses & Remains														
3. Crop & Feed Wastes														
4. Food Processing Wastes														
5. Employee Cafeteria Wastes														
6. Household Refuse														
7. Water & Sewage Treatment Sludge														
8. Incinerator Residue*														
9. Soil, Stone, Ashes														
10. Wood														
11. Paper														
12. Textiles														
13. Rubber														
14. Leather														
15. Glass & Pottery														
16. Plastics														
17. Radioactive Materials														
18. Bulky Ferrous Metal														
19. Other Ferrous Metal														
20. Non-Ferrous Metal														
21. Organic Chemicals														
22. Inorganic Chemicals														
23. Compost*														
24. Lagoon Supernatant & Residue*														
25. Other (Specify)														

*Residues and intermediate products that resulted from on-site or company-owned solid waste processing and volume reduction practices.

III. STORAGE OF SOLID WASTES

Firm No. ____

A. Waste Types	B. Land Required for Storage sq. ft.	C. Method of Storage (Check)								D. Storage Problems (Check where Applicable)						
		Galvanized Can	Compacting Container	Closed Bulk Container	Open Bulk Container	Pallet	Open Pile	Covered Pile	Other (Specify)	Inadequate Capacity	Vectors	Odors	Drainage	Unsightly	Difficulty in Handling	Other (Specify)
1. Manure w/Bedding, Feed, Soil																
2. Animal Carcasses & Remains																
3. Crop & Feed Wastes																
4. Food Processing Wastes																
5. Employee Cafeteria Wastes																
6. Household Refuse																
7. Water & Sewage Treatment Sludge																
8. Incinerator Residue*																
9. Soil, Stone, Ashes																
10. Wood																
11. Paper																
12. Textiles																
13. Rubber																
14. Leather																
15. Glass & Pottery																
16. Plastics																
17. Radioactive Materials																
18. Bulky Ferrous Metal																
19. Other Ferrous Metal																
20. Non-Ferrous Metal																
21. Organic Chemicals																
22. Inorganic Chemicals																
23. Compost*																
24. Lagoon Supernatant & Residue*																
25. Other (Specify)																
E. Total Storage Capacity Utilized, Cu. Yds.																

*Residues and intermediate products that resulted from on-site or company-owned processing and volume reduction practices.

IV. WASTE COLLECTION AND TRANSPORTATION

A. Wastes Types	B. Collection Frequency (Times/Month)	C. Primary Method of Waste Transport (Check only one)						D. Type of Agency Performing Collection (Check)				E. Company-Owned Collection Trucks Number/Capacity (cu. yds.)				
		Truck	Rail	Pipeline	Barge or Ship	Belt, Chain, or Screw Conveyor	Other (Specify)	Company Employees	Private Contractor	Municipality	County	Compacting Truck	Covered Non-Compacting Truck	Open Top Non-Compacting Truck	Tank Truck	Other (Specify)
1. Manure w Bedding, Feed, Soil																
2. Animal Carcasses & Remains																
3. Crop & Feed Wastes																
4. Food Processing Wastes																
5. Employee Cafeteria Wastes																
6. Household Refuse																
7. Water & Sewage Treatment Sludge																
8. Incinerator Residue*																
9. Soil, Stone, Ashes																
10. Wood																
11. Paper																
12. Textiles																
13. Rubber																
14. Leather																
15. Glass & Pottery																
16. Plastics																
17. Radioactive Materials																
18. Bulky Ferrous Metal																
19. Other Ferrous Metal																
20. Non-Ferrous Metal																
21. Organic Chemicals																
22. Inorganic Chemicals																
23. Compost*																
24. Lagoon Supernatant & Residue*																
25. Other (Specify)																

*Residues and intermediate products that resulted from on-site or company-owned solid waste processing and volume reduction practices.

V. DISPOSAL OF SOLID WASTES

Firm No. _____

B. Final Disposal and Volume Reduction Methods (Indicate Percent of Waste Disposed of by Each Method and the Type of Ownership of Disposal Facilities)**

	Salvage	Burning Dump or Pile	Dump - No Burning	Sanitary Landfill	Spread on Land	Lagoon	Composting	Tepee Burner	Incinerator or Boiler	Sea Disposal	Fed to Swine	Underground Injection	Fed to Livestock	Burn Barrell	Other (Specify)
1. Manure w/Bedding, Feed, Soil															
2. Animal Carcasses & Remains															
3. Crop & Feed Wastes															
4. Food Processing Wastes															
5. Employee Cafeteria Wastes															
6. Household Refuse															
7. Water & Sewage Treatment Sludge															
8. Incinerator Residue*															
9. Soil, Stone, Ashes															
10. Wood															
11 Paper															
12. Textiles															
13. Rubber															
14. Leather															
15. Glass & Pottery															
16. Plastics															
17. Radioactive Materials															
18. Bulky Ferrous Metal															
19. Other Ferrous Metal															
20. Non-Ferrous Metal															
21. Organic Chemicals															
22. Inorganic Chemicals															
23. Compost*															
24. Lagoon Supernatent Residue*															
25. Other (Specify)															

*Residues and intermediate products that resulted from company-owned solid waste processing and volume reduction practices.

**For each waste type, specify the percent of waste disposed of by each method. Alongside this percent figure, categorize the disposal facility owner according to these code letters: C - company owned, P - private contractor, M - municipality, R - county or regional authority. Example - if 85% of a waste type is disposed of in a municipal facility, enter 85M in the appropriate cell.

VI. FINAL DISPOSAL AND VOLUME REDUCTION SITES

Firm No. _____

Note: On the reverse side of this page, give the names and addresses of off-premises disposal and volume reduction installation

A. Final Disposal and Volume Reduction Methods	B. Haul Distance to Final Disposal or Volume Reduction Facility, Miles (Specify Mileage According to Site Ownership)				C. Company-Owned Final Disposal Facilities			
	Company Owned	Private Contractor	Municipality	County or Regional Authority	Date Initiated or Constructed Month-year	Estimated Remaining Life Years	Space Requirements: Building Area ft²	Space Requirements: Land Area Acres
1. Salvage								
2. Dump-Burning								
3. Dump-No Burning								
4. Sanitary landfill								
5. Spread on Land								
6. Lagoon								
7. Composting								
8. Tepee Bruner								
9. Incinerator or Boiler								
10. Sea Disposal								
11. Fed to Swine								
12. Underground Injection								
13. Burn Barrell								
14. Fed to Livestock								
15. Other (Specify)								

VII. EXPENDITURES FOR SOLID WASTE MANAGEMENT

Firm No. _____

A. Final Disposal and Reduction Methods	B. Internal Capital Cost of Function		C. Internal Annual Expenditures		D. Annual Charges by External Solid Waste Handlers			E. Total Annual Cost of Function $/Yr
	Initial Capital Investment Dollars	Est. Life Remaining Years	Labor Requirements Man-hours/Yr	Annual Operating Costs $/Yr	Private Contractor $/Yr.	Municipality $/Yr	County or Regional Authority $/Yr	
Processing								
Storage								
Collection								
Disposal								
Total								

F. Total Annual Return From Salvage $ _____/Yr

RADIOLOGICAL HEALTH INQUIRY

Are low back x-rays required of your employees? Yes ☐ No ☐

If yes, at what frequency? _____

Firm No. _____

VIII. ENTERPRISE PRODUCTION DATA

A. Distribution of Product Value

1. Give the percentage distribution of the total dollar value of shipments or sales during calendar 19____* by product category (SIC Group):

SIC No. (4-Digit)	Product Category (SIC Group Name)	Percent

2. What was the total dollar value of shipments or sales during calendar 19____* ?

$ _____

B. Quantity of Production of Major Products

Name of Major Product	Unit of Measure (Specify)	SIC No. (4-Digit)	19____* Production	Production Capacit (in units specifie

C. Quantity of Major Types of Input Materials Consumed

NOTE: (1) Use special attachment sheets as necessary.

(2) Refer to:
U.S. BUREAU OF THE CENSUS, CENSUS OF MANUFACTURES: 1967
List of Materials Consumption Items, Series MC67-6.
U.S. Government Printing Office, Washington, D.C. 1969

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* Enter last full calendar year.

SPECIAL ATTACHMENT SHEET

C. Quantity of Major Types of Input Materials Consumed

NOTE: (1) Use special attachments sheets as necessary.

(2) Refer to:
U.S. BUREAU OF THE CENSUS, CENSUS OF MANUFACTURES: 1967
List of Materials Consumption Items, Series MC67-6
U.S. Government Printing Office, Washington, D.C. 1969

Name of Material	Material Code	Unit of Measure	19___* Consumption	Consumption Reported in 1967 Census of Manufactures

* Enter last full calendar year.

SIC Code _____ Firm No. _____

SPECIAL ATTACHMENT SHEET ON HAZARDOUS WASTES

Explanation: Hazardous wastes are considered to be those wastes which can cause a highly offensive reaction upon exposure and includes such items as poisons (heavy metal poisons, nerve poisons, herbicides, insecticides, rodenticides, etc.), strong acids, caustics, diseased body tissue, etc.

Do you have any hazardous waste materials to dispose of? Yes ____ No ____

Do you have containers that held these materials to dispose of? Yes ____ No ____

Materials

What type of hazardous wastes do you have to dispose of?

___ Heavy metal poisons
___ Gases
___ Pesticides
___ Acids or caustics
___ Infectious materials
Name materials (trade name or chemical)_____

_____

What quantities of the above materials do you have to dispose of per year. Specify.

_____

_____

How is the material stored until it is removed for disposal:

___ In original containers
___ In bulk containers or pit
___ In a special container. Specify-

_____

___ In a pile
___ Disposed of immediately

Where is the material stored?

___ At random
___ Confined inside a building
___ Confined outside a building

Length of storage:

Number of hours ____
Number of Days ____
Number of Mos. ____
Number of years ____

Do you make any preparation of the material before disposal?

___ Packaging
___ Solidifying or concentrating
___ Neutralizing (chemical)
___ Aging
___ Heat treatment
___ Other (specify)_____

_____

Continued...

Containers

What types of empty containers do you have to dispose of?

___ Aerosol cans, approx. no. per year _____
___ Unpressurized cans, bottles, etc. under 5 gal. Approx. no. per year _____
___ 5 Gal. cans. Approx. no. per year _____
___ Drums under 55 gal. Approx. no. per year _____
___ 55 gal. drums. Approx. no. per year _____
___ Small paper bags (under 25# capacity) Approx. No. per year _____
___ Large paper bags (25# to 100# capacity) Approx. no. per year _____
___ Other. Specify_____

Types of materials these containers held. e.g. (2-4-D, Malathion, methyl bromide, sulphuric acid, caustic soda, etc.)

_____

_____

_____

How are these used containers stored until disposal?

___ At random
___ Confined in a building
___ Confined outside a building
___ Disposed of as used
___ Other

How long are the containers stored before Disposal?

Number of hours ____
Number of days ____
Number of Mos. ____
Numbef of years ____

Is there any preparation for disposal of these containers?

___ Burned out
___ Chemical neutralization
___ Aging
___ Other. Specify _____

_____

Continued...

SIC Code ____ Firm No.____

...Continued

Materials

Disposal consists of one or more of the following:

____ Rendering
____ Burning
____ Incineration
____ Salvaged, reused or sold
____ Permanently stored on company property
____ Buried or dumped on company property
____ Hauled off by garbage collector, or individual for hire
____ Delivered to city or county refuse disposal site by employees
____ Other. Specify _____

Containers

How is disposal accomplished?

____ Containers returned to factory
____ Sold or reused as salvage containers
____ Permanently stored on company property
____ Buried or dumped on company property
____ Hauled off by garbage collector, or individual for hire
____ Delivered to city or county refuse disposal site by company employee.
____ Other. Specify _____

Comments: _____

APPENDIX B

SIC Groups Comprising
Each Survey Group (S.G.)

SURVEY GROUP	DESCRIPTION	SIC NUMBERS
1.	Small Arms Ammunition	196
2.	Meat Products	201
3.	Dairy Products	202
4.	Canned and Preserved Fruits and Vegetables	203
5.	Grain Mill Products	204
6.	Bakeries and Confectionaries	205 & 207
7.	Sugar	206
8.	Beverages	208
9.	Miscellaneous Food	209
10.	Textile Knitting Mills	225
11.	Canvas and Textile Shops	239
12.	Sawmills and Planing Mills	242
13.	Plywood and Veneer Plants	2432
14.	Poles and Miscellaneous Wood Products	249
15.	Millwork Plants	2431
16.	Cabinet and Furniture Shops	25
17.	Pulp and Paperboard Mills	262 & 263
18.	Paperboard and Plastic Containers	265
19.	Printing and Publishing	27

*** SIC GROUPS (Continued)

SURVEY GROUP	DESCRIPTION	SIC NUMBERS
20.	Chemicals	28
21.	Miscellaneous Plastic Products	307
22.	Leather Products	31
23.	Stone, Clay, and Concrete Products	32
24.	Foundries and Smelters	33
25.	Fabricated Metal Products	34
26.	Machinery and Machine Shops	35
27.	Electrical Equipment	36
28.	Transportation Equipment	37
29.	Prebuilt Homes, Mobile Homes	37
30.	Miscellaneous Manufacturing	38 & 39

APPENDIX C

Summary of Solid Waste Management Practices

INTRODUCTION

In a survey of this type, no data can be justifiably eliminated--even when the data analysis reveals large variations from the established trend. Since the reported data is estimated to be accurate to a ± 30%, only two significant figures are used in the appendices. Much of the data variance is due to the differences in company opinion as to what is a salvaged or recycled solid waste stream and what is a by-product stream. Further randomness is incorporated by the lack of any reliable data on which to base waste generation estimates.

ANNUAL VOLUMES

The solid waste volumes reported were totaled and divided by the total number of companies within that group. These were not true averages but are merely pseudo-averages, as all the companies in a group did not necessarily report every type of solid waste. A trace amount of waste is defined as less than one ton or one cubic yard of material.

COLLECTION, DISPOSAL AND VOLUME REDUCTION, STORAGE

The percentages associated with the type of collection agency, type of disposal or volume reduction site, and the type of storage container are all calculated using the total number of agencies, sites, or containers reported within a given industrial group. The percentages are not calculated on a company basis, since a given company might utilize more than one service in collection, disposal, or storage.

EXTRAPOLATION FACTOR

The extrapolation factor is defined as the annual volume divided by the average number of employees. This factor can be helpful in estimating the solid waste volumes generated by a non-surveyed company which would be included in the respective industrial groups. The decimal place accuracy of the factor is very misleading, and it must be emphasized that these numbers are derived from data which is considered to be accurate only to ± 30%. In each case, the factor is reported to two significant figures but must be utilized only to generate "ball park" estimates.

In order to estimate a company's solid waste generation for a specific material, merely multiply the number of company employees by the correct extrapolation factor. The estimate of solid waste material will be in the same units as the reported annual volume of that material. The collection, disposal, and storage percentages will then indicate the most probable solid waste handling techniques.

AVERAGE WEEKS WORKED PER YEAR

This is an average of the weeks per year worked which were reported by each company.

AVERAGE NUMBER EMPLOYED

This is an average based on the maximum number of production workers employed by each company.

AVERAGE COSTS

These costs are broken down into capital investment, internal annual expenditures, and external annual expenditures for solid waste processing, storage, collection,

and disposal. These are the averages of those items reported by the companies within an industrial group.

AVERAGE ANNUAL RECYCLING INCOME

This is a pseudo-average of the individual total incomes generated by salvaging solid waste materials. This number is not accurate because the companies comprising an industrial group might not report salvaged material on the same basis. That is, a solid waste stream might be recycled for income by one company, and a similar company might consider the same material a by-product stream whose income would not be associated with recycling income.

ABBREVIATIONS & SYMBOLS USED IN APPENDIX C

Collection

CO - Company employees
MUNC - Municipal employees
PVT - Private contractor

Disposal & Volume Reduction

AIR - Vented to atmosphere
BOILER - Boiler Fuel
BURN BBL - Burn barrel
CANAL - Irrigation canal
CO DRYWELL - Company drywell for liquid disposal
CO DUMP - Company dump
CO FILL - Company fill material or spread on company land
CO INCIN - Company incineration
CO LAGOON - Company lagoon
CO NEUT PIT - Company neutralizing pit
CO SALV - Company salvage or recycling
CO SANT - Company sanitary landfill
COUN RD - Used on county road
E DUMP - External dump
E FILL - External fill material or spread on private land
E SALV - External salvage or recycling
E SANT - External sanitary landfill
ER CONT - Used for erosion control
REND - Rendering plant
SEWER - Sewer system
TP BURNER - Tepee burner

Storage Containers

BBL - 55-gallon barrel
BAG - Plastic or paper bag
BALE - Baled material
BASKET - 5-gallon waste basket
BOILER - Boiler
BOX - Small wooden or cardboard box
BULK - Bulk container (2 to 15 yd.)
BUNKER - Large concrete bunker
GALV - Galvanized can
INCIN - Incinerator
LAGOON - Lagoon or settling pond
NONE - No storage
ORIG - Original container
PILE - Open pile
TANK - Bulk tank
TP BURNER - Tepee burner
TRAILER - Trailer
TRUCK - Truck

SURVEY GROUP (2)
MEAT PRODUCTS

SIC NUMBER (201) — 23 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)						
	(21) FOOD PROCESSING WASTE, ANIMAL REMAINS	(8) MANURE	(19) PAPER	(6) WOOD	(11) INCINERATOR RESIDUE	(9) MISCELLANEOUS: METAL, GLASS & PLASTIC	(7) BLOOD & SEWER SLUDGE
ANNUAL VOLUMES							
[Ton]	110	220	---	4	Trace	--	1
[YD^3]	---	---	160	---	---	14	---
COLLECTION							
Frequency Range	4/mo - daily	4/mc - daily	2/mo - daily	4/mo - daily	2/yr - 4/mo	2/mo - daily	1/yr - cont.
% Agency	78% PVT 22% Co	71% Co 29% PVT	84% Co 10% PVT	83% Co 17% PVT	100% Co	78% Co 22% PVT	100% Co
DISPOSAL & VOLUME REDUCTION							
% Type of Site	67% Rend 27% E Sant 3% Co Sant 3% Co Dump	36% Co Lagoon 27% Co Fill 18% E Salv 9% E Sant 9% Co Dump	50% Burn BBL 25% E Sant 20% Co Incin 5% Co Dump	50% E Sant 33% Co Incin 17% Co Dump	45% E Sant 27% Co Dump 18% E Dump 9% Co Fill	76% E Sant 24% E Dump	57% Sewer 43% Lagoon
STORAGE							
Type of Container	56% BBL 26% Bulk 7% Open 7% Galv 4% Tank	60% Pile 40% Lagoon	44% BBL 39% Galv 11% Bulk 6% Pile	67% BBL 33% Pile	64% BBL 27% Incin 9% Pile	63% BBL 16% Bulk 16% Bulk 5% Galv	43% Tank 29% Lagoon 29% None
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	6.5	13	9.4	.24	---	.82	.06

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	17	Capital Investment - $2,000 Internal Annual Expenditures - 1,900 External Annual Expenditures - 130	$3,600

SURVEY GROUP (3)
DAIRY PRODUCTS

SIC NUMBER (202) — 17 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)							
	(14) FOOD PROCESSING WASTE	(16) PAPER	(10) Fe METALS	(1) LAGOON RESIDUE	(4) GLASS	(6) PLASTIC	(3) INCINERATOR RESIDUE	(4) MISCELLANEOUS: RUBBER, PAPER, LUNCH
ANNUAL VOLUMES								
[Ton]	6,600	---	12	---	---	---	---	---
[YD^3]	---	290	--	Trace	7	8	6	500
COLLECTION								
Frequency Range	2/mo - daily	4/mo - daily	1/yr - 22/mo	1-2/mo	4/mo - 22/mo	4/mo - 24/mo	4/mo - 12/mo	9/mo - 23/mo
% Agency	67% PVT 33% Co	50% Co 31% PVT 19% Munc	50% PVT 40% Co 10% Munc		50% PVT 25% Co 25% Munc	67% PVT 17% Co 17% Munc	67% PVT 33% Co	75% PVT 25% Munc
DISPOSAL & VOLUME REDUCTION	50% E Salv 18% E Sant	47% E Sant 26% E Dump	33% E Sant 33% E Salv	100% E Sant	50% E Sant 50% E Dump	67% E Sant 33% E Dump	67% E Sant 33% E Dump	75% E Sant 25% E Dump
% Type of Site	18% E Fill 9% Sewer 5% Canal	21% Co Incin 5% Burn BBL	33% E Dump					
STORAGE	31% Bulk 25% Galv	38% BBL 38% Bulk	60% BBL 20% Bulk	100% Bulk	50% BBL 25% Bulk	67% BBL 33% Bulk	33% Galv 33% Bulk	75% Bulk 25% BBL
Type of Container	19% Tank 13% BBL 6% Bag 6% Truck	25% Galv	10% Pile 10% Bale		25% Galv		33% BBL	
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	174	7.6	.32	---	.18	.21	.26	13

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	38	Capital Investment - $2,400 Internal Annual Expenditures - 1,300 External Annual Expenditures - 2,500	$380

SURVEY GROUP (4)
CANNED AND PRESERVED FRUITS AND VEGETABLES

SIC NUMBER (203) — 24 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)				
	(21) FOOD PROCESSING WASTE	(24) PAPER	(11) WOOD	(7) PLASTIC	(14) Fe METAL
ANNUAL VOLUMES					
[Ton]	13,000	---	--	--	20
[YD^3]	---	1,800	42	11	--
COLLECTION					
Frequency Range	4/mo - cont.	4/mo - 2 daily	4/mo - daily	9/mo - daily	1-3 per year
% Agency	72% PVT	62% Co	73% Co	57% Co	64% Co
	28% Co	25% PVT	18% PVT	29% PVT	18% PVT
		12% Munc	9% Munc	14% Munc	18% Munc
DISPOSAL & VOLUME REDUCTION	75% E Salv	56% E Sant	36% E Sant	71% E Sant	57% E Salv
	18% E Sant	28% E Dump	27% Co Dump	14% E Dump	21% E Sant
% Type of Site	4% E Dump	12% Co Dump	18% E Dump	14% Co Dump	21% E Dump
	4% Co Salv	4% Burn BBL	9% Co Sant		
			9% Burn BBL		
		4% BBL			
STORAGE	65% Bulk	69% Bulk	73% Bulk	71% Bulk	47% Pile
	22% Truck	12% Truck	27% Pile	14% Pile	40% Bulk
Type of Container	9% Pile	12% Pile		14% BBL	7% BBL
	4% BBL	4% Galv			7% Truck
EXTRAPOLATION FACTOR					
[Waste Volume/Average Number Employed]	46	6.4	.15	6.04	.07

(CONTINUED ON NEXT PAGE)

SURVEY GROUP (4) - Continued

	WASTE TYPE (COMPANIES REPORTING)			
	(9) LAGOON SUPERNATANT & SEWAGE TREATMENT SLUDGE	(12) SOIL, STONE, ASHES & INCINERATOR RESIDUE	(2) NON Fe METAL	MISCELLANEOUS: RUBBER, GLASS, LUNCH WASTE, FLOOR SWEEPINGS (10)
ANNUAL VOLUMES				
[Ton]	2,100	690	Trace	--
[YD^3]	---	---	---	42
COLLECTION				
Frequency Range	1-3 per yr. - daily	1/mo - daily	As needed	4/mo - 25/mo
% Agency	63% PVT	77% Co	50% Co	50% Co
	37% Co	23% PVT	50% PVT	33% PVT
				17% Munc
DISPOSAL & VOLUME REDUCTION				
% Type of Site	38% E Fill	46% E Fill		67% E Sant
	25% Co Fill	23% E Sant		33% E Dump
	25% E Salv	17% Co Fill	100% E Salv	
	12% Co Lagoon	8% Co Dump		
		8% E Salv		
STORAGE				
Type of Container	62% Lagoon	67% Pile		67% Bulk
	38% Bulk	22% bulk	100% Pile	33% Galv
		11% Lagoon		
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	7.5	2.5	---	.15

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS		AVERAGE ANNUAL RECYCLING INCOME
42	280	Capital Investment	- $53,000	$23,000
		Internal Annual Expenditures	7,800	
		External Annual Expenditures	3,300	

SURVEY GROUP (5)
GRAIN MILL PRODUCTS

SIC NUMBER (204) — 7 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)					
	(6) CROP & FEED WASTE	(5) PAPER	(2) SOIL, STONE, & ASHES	(3) Fe METAL	(3) WOOD	(2) CHEMICALS
ANNUAL VOLUMES						
[Ton]	140	7	4	Trace	Trace	---
[YD^3]	---	---	---	---	---	Trace
COLLECTION						
Frequency Range	1/mo - 8/mo	2/yr - 4/mo	1/yr - 1/mo	1/yr - as needed	2/yr	1/yr - as needed
% Agency	57% Co 43% PVT	100% Co	100% Co	100% Co	100% Co	100% Co
DISPOSAL & VOLUME REDUCTION						
% Type of Site	12% E Dump 50% E Salv 25% Co Salv 12% E Sant	40% Co Incin 40% E Sant 20% E Dump	67% E Dump 33% E Sant	50% E Dump 50% E Sant	67% Co Incin 33% E Sant	50% Co Dump 50% Co Fill
STORAGE						
Type of Container	56% Bulk 22% Bag 22% Pile	33% Bulk 33% Pile 17% Galv 17% BBL	50% Bag 50% Pile	67% Pile 33% Bulk	50% Pile 25% BBL 25% Bulk	50% Bulk 50% Orig
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	7	.35	.20	---	---	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	20	Capital Investment - $5,700 Internal Annual Expenditures - 360 External Annual Expenditures - 17	$180

SURVEY GROUP (6)
BAKERIES AND CONFECTIONARIES

SIC NUMBER (205 & 207) — 8 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)				
	(8) PAPER	(6) FOOD PROCESSING WASTE	(5) Fe METALS	(2) PLASTIC	(2) WOOD
ANNUAL VOLUMES					
[Ton]	---	13	--	--	2
[YD^3]	450	--	15	27	---
COLLECTION					
Frequency Range	1/mo - daily	8/mo - daily	1/yr - 27/mo	12/mo - 22/mo	8/mo - 22/mo
% Agency	75% PVT 22% Co	83% PVT 17% Co	67% Co 33% PVT	100% PVT	100% PVT
DISPOSAL & VOLUME REDUCTION	78% E Sant	71% E Salv	50% E Sant		
	11% E Dump	29% E Sant	33% E Salv	100% E Sant	100% E Sant
% Type of Site	11% E Salv		17% E Dump		
	11% BBL				
STORAGE	44% Bulk	50% Bulk	40% Pile		
	22% Pile	33% BBL	20% Bulk	100% Bulk	50% Bulk
Type of Container	11% Bag	17% Bag	20% Bag		50% Box
	11% Box		20% BBL		
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	15	.43	.50	.90	.07

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	30	Capital Investment - $ 2.50 Internal Annual Expenditures - 1,100.00 External Annual Expenditures - 290.00	$340.00

SURVEY GROUP (8)
BEVERAGES

SIC NUMBER (208) — 8 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)			
	(8) GLASS	(3) WOOD	(2) Fe METAL	(1) PLASTIC
ANNUAL VOLUMES				
[Ton]	--	---	---	Trace
[YD^3]	30	Trace	Trace	---
COLLECTION				
Frequency Range	4/mo - daily	8/mo - daily	9/mo - 24/mo	8/mo
% Agency	50% Co 50% PVT	67% PVT 33% Co	100% PVT	100% PVT
DISPOSAL & VOLUME REDUCTION				
% Type of Site	75% E Sant 25% E Dump	100% E Sant	100% E Sant	100% E Dump
STORAGE				
Type of Container	50% Bulk 12% Trailer 12% BBL 12% Pile 12% Galv	33% BBL 33% Bulk 33% Galv	50% Bulk 50% BBL	100% Bulk
EXTRAPOLATION FACTOR				
[Waste Volume/Average Number Employed]	3.7	---	---	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	8	Capital Investment - $ 29 Internal Annual Expenditures - 800 External Annual Expenditures - 190	-----

SURVEY GROUP (S)
MISCELLANEOUS FOOD

SIC NUMBER (209) — 5 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)				
	(4) FOOD PROCESSING WASTE	(5) PAPER	(3) WOOD	(3) PLASTIC & GLASS SWEEPINGS	(1) SOIL
ANNUAL VOLUMES					
[Ton]	110	---	---	--	Trace
[YD^3]	---	120	6	18	---
COLLECTION					
Frequency Range	1/mo - 70/mo	1/mo - 24/mo	2/mo - 24/mo	1/mo - 24/mo	4/mo
% Agency	75% PVT 25% Co	67% Co 33% PVT	100° Co	71% Co 29% PVT	100% Co
DISPOSAL & VOLUME REDUCTION					
% Type of Site	75% E Salv 25% E Dump	17% Salv 67% E Sant 17. Boiler	100% E Sant	71% E Sant 29% E Dump	100% E Sant
STORAGE				18% Pile	
	75% BBL	29% Bulk	50% Truck	27% Truck	50% Pile
	25% Bulk	29% Truck	25% Pile	18% Bulk	50% Truck
Type of Container		29% Pile	25% Bulk	18% BBL	
		14% Box		18% Box	
EXTRAPOLATION FACTOR					
[Waste Volume/Average Number Employed]	7.:	8.0	.40	1.2	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
48	15	Capital Investment - $ 1,900 Internal Annual Expenditures - 470 External Annual Expenditures - 54	$150

SURVEY GROUP (11)
CANVAS AND TEXTILE SHOPS

SIC NUMBER (239) — 5 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)			
	(5) TEXTILES	(4) PAPER	(1) SOIL	(1) HOUSEHOLD REFUSE [Lunch Box]
ANNUAL VOLUMES				
[Ton]	---	---	---	---
[YD^3]	8	6	Trace	Trace
COLLECTION				
Frequency Range	4/mo - 20/mo	4/mo - 20/mo	4/mo	As needed
% Agency	60% PVT 20% Co 20% Munc	50% Munc 25% PVT 25% Co	100% PVT	100% Co
DISPOSAL & VOLUME REDUCTION				
% Type of Site	60% E Sant 20% E Salv 20% E Dump	50% E Sant 25% E Dump 25% Burn BBL	100% E Sant	100% E Sant
STORAGE				
Type of Container	40% Galv 20% Bulk 20% Pile 20% Box	50% Galv 25% Bulk 25% Box	100% Galv	100% Box
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	2	1.5	---	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	4	Capital Investment - $ -----	None
		Internal Annual Expenditures - 10	
		External Annual Expenditures - 58	

SURVEY GROUP (12)
SAWMILLS AND PLANING MILLS

SIC NUMBER (242) — 35 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)					
	(35) WOOD	(25) PAPER	(29) INCINERATOR RESIDUE	(6) YARD DEBRIS	(22) Fe METALS	MISCELLANEOUS: SHOP WASTE, CAFETERIA WASTE, ETC. (15)
ANNUAL VOLUMES						
[Ton]	45,000	--	950	---	10	7
[YD^3]	---	91	---	260	--	---
COLLECTION						
Frequency Range	Daily - cont.	4/mo - daily	1/mo - 23/mo	1/mo - 4/mo	1/mo - 4/mo	1/yr - 4/mo
% Agency	100% Co	91% Co 9% PVT	100% Co	100% Co	83% PVT 17% Co	91% Co 9% PVT
DISPOSAL & VOLUME REDUCTION						
% Type of Site	37% TP Burner 30% Boiler 21% E Salv 11% Co Dump 2% Co Sant 2% E Dump	65% TP Burner 23% Boiler 8% E Dump 4% E Sant	55% Co Dump 38% Co Fill 4% E Dump 4% Co Sant	29% Co Fill 29% Co Dump 14% E Salv 14% Co Sant 14% E Fill	92% E Salv 2% Co Dump 2% E Dump	33% Co Dump 25% E Dump 17% E Sant 8% TP Burner 8% Boiler 8% E Salv
STORAGE						
% Type of Container	43% None 43% Pile 14% Bulk	48% Galv 19% Pile 19% Basket 7% Bulk 7% BBL	54% TP Burner 46% Boiler	50% Pile 50% None	92% Pile 4% Galv 4% Bulk	36% Galv 27% Pile 18% BBL 18% Bulk
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	410	.83	8.6	2.4	.09	.06

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
49	110	Capital Investment - $130,000 Internal Annual Expenditures - 9,300 External Annual Expenditures - 4,800	$58,000

SURVEY GROUP (13)
PLYWOOD AND VENEER PLANTS

SIC NUMBER (2432) — 4 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)					
	(4) WOOD	(3) PAPER	(2) SOIL & ASHES	(3) Fe METAL	(1) NON Fe METAL	(1) RUBBER
ANNUAL VOLUMES						
[Ton]	44,000	19	23,000	10	Trace	Trace
[YD^3]	---	---	---	--	---	---
COLLECTION						
Frequency Range	Cont. - 12/mo	1/mo - 23/mo	1/mo - 2/mo	2/mo - 1-2/mo	1-6/mo	1/mo
% Agency	100% Co	100% Co	100% Co	100% Co	100% Co	100% Co
DISPOSAL & VOLUME REDUCTION						
% Type of Site	33% Boiler 33% Co Fill 17% E Salv 17% TP Burner	25% Co Dump 25% Boiler 25% Fill 25% TP Burner	50% Co Fill 50% Co Dump	67% E Salv 33% Co Dump	100% E Salv	67% Co Dump 33% Boiler
STORAGE						
% Type of Container	100% Pile	33% Bulk 33% Pile 33% Galv	50% Bulk 50% Pile	100% Pile	100% Bulk	
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	290	13	150	107	---	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	150	Capital Investment - $38,000 Internal Annual Expenditures - 32,000 External Annual Expenditures - 190	$160,000

SURVEY GROUP (14)
POLES AND MISCELLANEOUS WOOD PRODUCTS

SIC NUMBER (249)

8 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)				
	(8) WOOD	(2) PAPER	(6) T.P. BURNER & INCINERATOR RESIDUE	(1) Fe METAL	(1) MISCELLANEOUS: SHOP WASTE
ANNUAL VOLUMES					
[Ton]	---	3	4	Trace	---
[YD^3]	10,000	---	---	---	Trace
COLLECTION					
Frequency Range	Daily - cont.	4/mo	1/yr - 4/mo	1/yr	1/yr
% Agency	80% Co 20% PVT	100% Co	100% Co	100% Co	100% PVT
DISPOSAL & VOLUME REDUCTION					
% Type of Site	36% E Salv 36% TP Burner 9% Er Cont 9% Co Dump 9% E Sant	100% Co Incin	100% Co Fill	100% Co Dump	100% E Dump
STORAGE					
% Type of Container	10% Bulk 40% None 30% Pile 20% Truck	50% Galv 50% Basket	80% TP Burner 20% Co Incin	100% Pile	100% BBL
EXTRAPOLATION FACTOR					
[Waste Volume/Average Number Employed]	830	.25	.33	---	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
49	12	Capital Investment - $5,100 Internal Annual Expenditures - 2,700 External Annual Expenditures - 750	$8.00

SURVEY GROUP (15)
MILLWORK PLANTS

SIC NUMBER (2431) — 23 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)			
	(23) WOOD	(19) PAPER & SHOP WASTE	(2) Fe METAL	(1) GLUE WASH
ANNUAL VOLUMES				
[Ton]	---	---	30	---
[YD^3]	3,100	120	--	Trace
COLLECTION				
Frequency Range	1/mo - daily	1/mo - 12/mo	1/mo - 10/mo	8/mo
% Agency	66% Co 34% PVT		100% PVT	100% Co
DISPOSAL & VOLUME REDUCTION				
% Type of Site	53% E Salv 14% E Dump 14% E Sant 11% Co Incin 6% Co Dump 3% TP Burner	53% E Sant 21% E Dump 10% Co Dump 10% Co Incin 5% TP Burner	100% E Salv	100% E Sant
STORAGE				
% Type of Container	41% Pile 35% Bulk 10% Trailer 10% BBL 4% Bag	33% Galv 28% BBL 22% Bulk 11% Bag 6% Trailer	100% Bulk	100% Bulk
EXTRAPOLATION FACTOR				
[Waste Volume/Average Number Employed]	89	3.4	.86	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
49	35	Capital Investment - $9,500 Internal Annual Expenditures - 1,200 External Annual Expenditures - 79	$200

SURVEY GROUP (16)
CABINET AND FURNITURE SHOPS

SIC NUMBER (25) — 13 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)						
	(9) WOOD	(8) PAPER	(5) TEXTILES	(6) MISCELLANEOUS: FLOOR SWEEPINGS, SPRINGS, GLASS, LUNCH WASTE, ETC.	(5) Fe METALS	(3) PLASTICS	(2) NON Fe METALS
ANNUAL VOLUMES							
[Ton]	---	---	---	---	--	--	Trace
[YD^3]	320	130	170	270	23	13	---
COLLECTION							
Frequency Range	1/mo - daily	4/mo - daily	1/mo - daily	4/mo - 17/mo	4/mo - daily	4/mo - daily	1/yr - 4/mo
% Agency	55% PVT 45% Co	88% PVT 12% Co	50% PVT 50% Co	75% Co 25% PVT	83% PVT 17% Co	100% PVT	50% PVT 50% Co
DISPOSAL & VOLUME REDUCTION							
% Type of Site	43% E Salv 29% E Sant 21% E Dump 7% Co Incin	62% E Sant 25% E Dump 13% Burn BBL	83% E Sant 17% E Salv	75% E Sant 25% E Dump	80% E Sant 20% E Dump	67% E Sant 33% E Dump	50% E Salv 50% E Sant
STORAGE							
% Type of Container	67% Bulk 22% Pile 11% Trailer	50% Galv 12% Pile 12% Bulk 12% Trailer 12% BBL	33% Bulk 17% Galv 17% Pile 17% BBL 17% Box	25% Trailer 25% Bag 25% Bulk 25% Galv	50% Galv 17% Trailer 17% Pile 17% Bulk	33% Galv 33% Bulk 33% Trailer	50% Galv 50% BBL
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	15	5.9	7.8	12	1.0	.59	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	22	Capital Investment - $ 150 Internal Annual Expenditures - 11,000 External Annual Expenditures - 180	$14

SURVEY GROUP (19)
PRINTING AND PUBLISHING

SIC NUMBER (27)

28 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)				
	(28) PAPER	(2) WOOD	(11) MISCELLANEOUS: FILM, INK CANS, FLOOR SWEEPINGS, ETC.	(4) GLASS	(3) PLASTIC
ANNUAL VOLUMES					
[Ton]	---	---	---	---	---
[YD^3]	320	1	5	Trace	Trace
COLLECTION					
Frequency Range	13/mo	1/mo - 23/mo	4/mo - 23/mo	4/mo - 23/mo	9/mo - 23/mo
% Agency	90% PVT 7% Co 3% Munc	100% PVT	100% PVT	75% PVT 25% Co	66% PVT 34% Munc
DISPOSAL & VOLUME REDUCTION					
% Type of Site	86% E Sant 8% E Dump 3% E Salv 3% Co Incin	100% E Sant	91% E Sant 9% E Salv	75% E Sant 25% E Dump	66% E Sant 34% E Dump
STORAGE					
% Type of Container	57% Bulk 39% Galv 4% BBL	100% Bulk	64% Bulk 27% Galv 9% Pile	50% Galv 50% Bulk	66% Galv 34% Bulk
EXTRAPOLATION FACTOR					
[Waste Volume/Average Number Employed]	19	.06	.3	---	---

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SURVEY GROUP (19) - Continued

	WASTE TYPE (COMPANIES REPORTING)				
	(6) Fe METAL	(5) NON Fe METAL	(1) ORGANIC CHEMICAL	(1) INORGANIC CHEMICAL	(1) RUBBER
ANNUAL VOLUMES					
[Ton]	---	---	---	---	---
[YD^3]	Trace	Trace	Trace	Trace	Trace
COLLECTION					
Frequency Range	4/mo - 27/mo	As needed - 1/yr	1/mo	27/mo	27/mo
% Agency	83% PVT 17% Co	80% PVT 20% Co	100% Co	100% PVT	100% PVT
DISPOSAL & VOLUME REDUCTION					
% Type of Site	83% E Sant 17% E Dump	100% Salv	100% E Sant	100% E Sant	100% E Sant
STORAGE					
% Type of Container	50% Bulk 50% Galv	40% Pile 20% Bulk 20% Box 20% Galv	100% Orig	100% Bulk	100% Bulk
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	---	---	---	---	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	17	Capital Investment - $113 Internal Annual Expenditures - 313 External Annual Expenditures - 230	$10

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SURVEY GROUP (20)
CHEMICALS

SIC NUMBER (28) — 8 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)						
	(8) PAPER	(4) WOOD	(5) Fe METAL	(1) NON Fe METAL	(2) MISCELLANEOUS: SHOP WASTE	SOIL & STONE	INORGANIC & ORGANIC CHEMICALS
ANNUAL VOLUMES							
[Ton]	53	3	390	Trace	Trace	Confidential	Confidential
[YD^3]	--	---	---	---	---	"	"
COLLECTION							
Frequency Range	1/mo - daily	1/mo - daily	1/yr - 1/mo	1/mo	4/mo		
% Agency	75% Co	75% Co	60% Co	100% PVT	50% PVT	"	"
	25% PVT	25% PVT	40% PVT		50% Co		
DISPOSAL & VOLUME REDUCTION	45% E Sant						
	22% Co Incin	50% Co Sant	60% E Salv	100% E Salv	50% E Sant		
% Type of Site	22% Co Sant	25% Co Dump	20% E Sant		50% Co Dump	"	"
	11% Co Dump	25% E Sant	20% Co Dump				
STORAGE	39% Galv						
	25% Bulk	50% Pile	80% Pile	100% Bulk	50% Bulk	"	"
% Type of Container	12% Box	50% Bulk	20% Bulk		50% Pile		
	12% BBL						
	12% Pile						
EXTRAPOLATION FACTOR							
[Waste Volume/Average Number Employed]	.42	.02	3.1	---	---	"	"

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS		AVERAGE ANNUAL RECYCLING INCOME
52	125	Capital Investment	- $20,000	Confidential
		Internal Annual Expenditures	- 77,000	
		External Annual Expenditures	- 19	

XXXXX

SURVEY GROUP (21)
MISCELLANEOUS PLASTIC PRODUCTS

SIC NUMBER (307) — 5 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)				
	(5) PLASTIC	(4) PAPER	(3) WOOD	(3) Fe METAL	(1) MISCELLANEOUS: LUNCH WASTE, ETC.
ANNUAL VOLUMES					
[Ton]	49	9	11	---	Trace
[YD^3]	--	---	--	5	---
COLLECTION					
Frequency Range	1/mo - daily	2/mo - daily	2/mo - 5/mo	1/mo - 4/mo	4/mo
% Agency	67% Co 33% PVT	50% Co 50% PVT	75% Co 25% PVT	67% PVT 33% Co	100% Co
DISPOSAL & VOLUME REDUCTION					
% Type of Site	71% E Sant 14% E Salv 14% E Dump	80% E Sant 20% Burn BBL	75% E Sant 25% Burn BBL	67% E Salv 33% E Sant	100% E Sant
STORAGE					
% Type of Container	33% Bulk 33% Pile 17% Truck 17% Galv	50% Bulk 25% Pile 25% BBL	67% Pile 33% BBL	100% Pile	100% Galv
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	3.2	1	1.2	.55	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
51	9	Capital Investment - $ 720 Internal Annual Expenditures - 2,600 External Annual Expenditures - 120	$260

SURVEY GROUP (22)
LEATHER PRODUCTS

SIC NUMBER (31) — 5 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)		
	(5) LEATHER	(4) PAPER	(1) WOOD, Fe METAL, NON Fe METAL
ANNUAL VOLUMES			
[Ton]	13	6	Trace
[YD^3]	--	---	---
COLLECTION			
Frequency Range	6/mo - 12/mo	6/mo - 12/mo	6/mo
% Agency	60% PVT 40% Munc	50% PVT 50% Munc	100% Munc
DISPOSAL & VOLUME REDUCTION			
% Type of Site	40% E Sant 40% E Dump 20% E Salv	50% E Dump 50% E Sant	100% E Dump
STORAGE			
% Type of Container	40% Pile 20% Box 20% Bulk 20% Galv	40% Galv 40% Box 20% Bulk	50% Galv 50% Box
EXTRAPOLATION FACTOR			
[Waste Volume/Average Number Employed]	2.6	1.2	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	5	Capital Investment - Trace Internal Annual Expenditures - $73.00 External Annual Expenditures - 62.00	---

SURVEY GROUP (23)
STONE, CLAY, AND CONCRETE PRODUCTS

SIC NUMBER (32) — 22 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)						
	(16) SOIL AND STONE	(18) PAPER	(5) WOOD	(9) Fe METALS	(5) MISCELLANEOUS: SHOP WASTE, TRUCK WASHINGS	(5) INCINERATOR RESIDUE	(2) INORGANIC CHEMICALS
ANNUAL VOLUMES							
[Ton]	---	--	--	5	5	Trace	Trace
[YD^3]	620	36	17	---	---	---	---
COLLECTION							
Frequency Range	2/mo - daily	2/mo - daily	1/mo - 4/mo	2/mo - 1/yr	4/mo - as needed	1/yr - 1/mo	continuous - as needed
% Agency	89% Co 11% PVT	67% Co 33% PVT	80% Co 20% PVT	67% PVT 33% Co	80% Co 20% PVT	100% Co	100% Co
DISPOSAL & VOLUME REDUCTION							
% Type of Site	45% Co Fill 25% E Salv 15% E Fill 10% Co Lagoon 5% Coun Road	50% Co Incin 33% E Sant 11% E Dump 6% Co Dump	40% E Sant 20% Co Dump 20% E Dump 20% Incin	44% E Salv 33% E Sant 23% Co Dump	40% Co Dump 40% E Dump 20% Co Fill	80% Co Fill 20% E Sant	50% Co Lagoon 50% Co Fill
STORAGE							
% Type of Container	63% Pile 19% None 12% Lagoon 6% Bunker	61% Galv 16% Bulk 11% Pile 6% Bag 6% Bbl	40% Pile 40% BBL 20% Bag	89% Pile 11% Bulk	40% None 20% Bag 20% BBL 20% Box	100% Co Incin	50% Lagoon 50% None
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	56	3.3	1.5	.45	.45	---	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS		AVERAGE ANNUAL RECYCLING INCOME
49	11	Capital Investment	- $ 400	$37
		Internal Annual Expenditures	- 1,300	
		External Annual Expenditures	- 6	

SURVEY GROUP (25)
FABRICATED METAL PRODUCTS

SIC NUMBER (34) — 22 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)						
	(21) Fe METAL	(9) NON Fe METAL	(20) PAPER	(7) SHOP WASTE	(7) WOOD	(4) CHEMICALS	(2) TEXTILES
ANNUAL VOLUMES							
[Tog]	51	4	---	---	---	Trace	---
[YD^3]	--	---	140	9	5	---	Trace
COLLECTION							
Frequency Range	1/yr - 9/mo	1-3/yr - 2/mo	2/yr - 9/mo	1/mo - 4/mo	2/yr - 9/mo	2/yr - cont	2/mo - 4/mo
% Agency	61% PVT 39% Co	56% PVT 44% Co	53% Co 47% PVT	43% PVT 43% Co 14% Munc	63% Co 37% PVT	75% Co 25% PVT	50% PVT 50% Co
DISPOSAL & VOLUME REDUCTION							
% Type of Site	63% E Salv 33% E Sant 4% Co Fill	100% E Salv	88% E Sant 6% E Dump 6% Co Incin	86% E Sant 14% E Dump	100% E Sant	50% E Sant 25% E Dump 25% Atmosphere	100% E Sant
STORAGE							
% Type of Container	37% Bulk 37% Pile 21% BBL 4% Box	33% BBL 33% Pile 33% Bulk	47% Bulk 23% Galv 23% BBL 6% Pile	43% Bulk 43% BBL 14% Galv	63% Bulk 25% Pile 13% BBL	75% Bulk 25% BBL	100% Bulk
EXTRAPOLATION FACTOR							
[Waste Volume/Average Number Employed]	2.8	.22	7.8	.41	.28	---	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
51	18	Capital Investment - $ 93 Internal Annual Expenditures - 80 External Annual Expenditures - 220	$750

SURVEY GROUP (26)
MACHINERY AND MACHINE SHOPS

SIC NUMBER (35) — 25 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)					
	(24) Fe METAL	(7) NON Fe METAL	(18) PAPER	(9) WOOD	(1) INCINERATOR RESIDUE	(13) MISCELLANEOUS: SHOP WASTE, RUBBER, RAGS
ANNUAL VOLUMES						
[Ton]	15	Trace	--	1	---	1
[YD^3]	--	---	14	---	Trace	---
COLLECTION						
Frequency Range	1/yr - 8/mo	1/yr - 8/mo	1/yr - 20/mo	1/yr - 20/mo	1/mo	1/yr - 9/mo
% Agency	51% PVT 49% Co	57% Co 43% PVT	56% Co 44% PVT	55% PVT 45% Co	100% Co	77% Co 23% PVT
DISPOSAL & VOLUME REDUCTION			5% Co Dump			
% Type of Site	52% E Salv 30% E Sant 10% E Dump 8% Co Dump	67% E Salv 33% E Sant	47% E Sant 21% Incin 21% Burn BBL 5% E Dump	55% E Sant 22% Incin 22% E Dump	100% Co Dump	40% E Dump 40% E Sant 13% Burn BBL 7% Co Dump
STORAGE						
% Type of Container	45% Pile 22% BBL 15% Galv 12% Bulk 5% Box	29% BBL 29% Pile 14% Bulk 14% Box 14% Galv	61% Galv 33% Bulk 6% Box	45% Pile 33% Bulk 22% Galv	100% Incin	29% Pile 21% Bulk 21% Can 14% BBL 7% Trailer 7% Box
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	1.5	---	1.4	.1	---	.1

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	10	Capital Investment - $110 Internal Annual Expenditures - 91 External Annual Expenditures - 61	$110

SURVEY GROUP (27)
ELECTRICAL EQUIPMENT

SIC NUMBER (36) — 6 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)					
	(6) PAPER	(6) PLASTIC	(3) Fe METAL	(3) NON Fe METAL	(2) INORGANIC CHEMICAL	MISCELLANEOUS: GLASS, WOOD, FLOOR SWEEPINGS (2)
ANNUAL VOLUMES						
[Ton]	---	--	2	Trace	---	---
[YD^3]	120	13	---	---	Trace	4
COLLECTION						
Frequency Range	1/mo - 9/mo	1/mo - 9/mo	2/yr - 9/mo	2/yr - 11/mo	1/mo - as needed	1/mo - 9/mo
% Agency	71% PVT 29% Co	83% PVT 17% Co	100% PVT	100% PVT	100% Co	75% PVT 25% Co
DISPOSAL & VOLUME REDUCTION						
% Type of Site	71% E Sant 14% Co Incin 14% E Dump	83% E Sant 17% E Dump	67% E Sant 33% E Salv	67% E Salv 33% E Sant	50% Co Drywell 50% Co Neut Pit	75% E Sant 25% E Dump
STORAGE						
% Type of Container	33% Galv 17% BBL 17% Bulk 17% Bag 17% Basket	33% Galv 17% BBL 17% Bulk 17% Bag 17% Basket	67% BBL 33% Bulk	67% BBL 33% Basket	50% None 50% 5-gallon container	50% Galv 25% BBL 25% Bulk
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	20	2.2	.33	---	---	.67

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS		AVERAGE ANNUAL RECYCLING INCOME
52	6	Capital Investment	- $18,960	$312
		Internal Annual Expenditures	- 6,087	
		External Annual Expenditures	- 4,510	

SURVEY GROUP (28)
TRANSPORTATION EQUIPMENT

SIC NUMBER (37) — 12 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)					
	(6) WOOD	(4) SOIL, STONE, & ASHES	(12) PAPER	(6) Fe METAL	(6) NON Fe METAL	(2) PLASTICS
ANNUAL VOLUMES						
[Ton]	---	10	---	4	Trace	--
[YD^3]	380	--	170	---	---	15
COLLECTION						
Frequency Range	1/mo - daily	1/yr - 2/mo	1/mo - daily	1/yr - 4/mo	2/yr - 1/mo	1/mo - 4/mo
% Agency	67% Co 33% PVT	100% Co	67% Co 33% PVT	67% Co 33% PVT	67% Co 33% PVT	100% Co
DISPOSAL & VOLUME REDUCTION						
% Type of Site	42% E Dump 29% E Sant 29% Co Incin	75% Co Fill 25% E Dump	42% E Sant 33% E Dump 25% Co Incin	14% E Dump 43% E Salv 14% Co Salv 29% E Sant	83% E Salv 17% Co Salv	50% E Sant 50% E Salv
STORAGE						
% Type of Container	33% Box 33% Bulk 17% Truck 17% Pile	50% Co Incin 25% Pile 25% Truck	42% Bulk 17% Galv 8% Truck 8% BBL 8% Pile 8% Box 8% Baskets	67% Pile 17% Bulk 17% Box	67% Bulk 17% Box 17% Pile	50% Bulk 50% Box
EXTRAPOLATION FACTOR						
[Waste Volume/Average Number Employed]	22	.59	10	.24	---	.88

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS		AVERAGE ANNUAL RECYCLING INCOME
50	17	Capital Investment	- $ 260	$110
		Internal Annual Expenditures	- 1,700	
		External Annual Expenditures	- 600	

SURVEY GROUP (29)
PREBUILT HOMES, MOBILE HOMES

SIC NUMBER (37)

10 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)				
	(8) PAPER	(9) WOOD	(4) Fe METAL	(8) NON Fe METAL	(4) PLASTIC, TEXTILES FLOOR SWEEPINGS
ANNUAL VOLUMES					
[Ton]	---	---	10	12	---
[YD^3]	16,000	6,700	--	--	360
COLLECTION					
Frequency Range	4/mo - daily	4/mo - daily	1/mo - 13/mo	1/mo - 4/mo	1/mo - daily
% Agency	86% Co 14% PVT	75% Co 25% PVT	50% Co 50% PVT	71% PVT 29% Co	100% Co
DISPOSAL & VOLUME REDUCTION					
% Type of Site	88% E Sant 12% E Dump	77% E Sant 11% E Dump 11% Co Dump	75% Salv 25% E Sant	100% E Salv	50% E Sant 25% Co Salv 25% Co Dump
STORAGE					
% Type of Container	62% Bulk 25% Galv 13% Trailer	67% Bulk 22% Galv 11% Trailer	75% Bulk 25% Box	12% Box 62% Bulk 12% Pile 12% BBL	50% Bulk 25% Trailer 25% Box
EXTRAPOLATION FACTOR					
[Waste Volume/Average Number Employed]	180	75	.11	.13	4.0

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
52	90	Capital Investment - $ 1,800 Internal Annual Expenditures - 11,000 External Annual Expenditures - 3,700	$2,100

SURVEY GROUP (30)
MISCELLANEOUS MANUFACTURING

SIC NUMBER (38 & 39)

10 COMPANIES

	WASTE TYPE (COMPANIES REPORTING)						
	(8) PAPER	(6) PLASTIC	(7) Fe METAL	(5) NON Fe METAL	(3) WOOD	(4) MISCELLANEOUS: GLASS, SHOP WASTE, WHOLE SIGNS, SIGN TRANSFORMERS	(1) RUBBER
ANNUAL VOLUMES							
[Ton]	--	--	--	Trace	--	--	Trace
[YD^3]	57	17	12	---	26	20	---
COLLECTION							
Frequency Range	2/yr - 9/mo	4/mo - 9/mo	1/yr - 9/mo	1/yr - 4/mo	4/mo - 8/mo	1/yr - 9/mo	7/mo
% Agency	75% PVT 25% Co	83% PVT 17% Co	57% PVT 73% Co	60% PVT 40% Co	67% PVT 33% Co	75% PVT 25% Co	100% PVT
DISPOSAL & VOLUME REDUCTION							
% Type of Site	100% E Sant	100% E Sant	86% E Sant 14% E Salv	60% E Salv 40% E Sant	100% E Sant	50% E Sant 25% E Dump 25% E Salv	100% E Sant
STORAGE							
% Type of Container	62% Galv 25% Bulk 13% Box	67% Galv 17% Bulk 17% Box	50% Galv 25% Pile 13% Bulk 13% BBL	40% Pile 20% Galv 20% Box 20% BBL	33% Galv 33% Bulk 33% Box	50% Pile 25% Galv 25% Bulk	100% Galv
EXTRAPOLATION FACTOR [Waste Volume/Average Number Employed]	5.7	1.7	1.2	---	2.6	2.0	---

AVERAGE WEEKS WORKED PER YEAR	AVERAGE NUMBER EMPLOYED	AVERAGE COSTS	AVERAGE ANNUAL RECYCLING INCOME
48	10	Capital Investment - $ 2 Internal Annual Expenditures - 210 External Annual Expenditures - 45	$330

APPENDIX D

Hazardous Wastes

Data reported on hazardous wastes materials was very limited and sporadic. For this reason, volumes of the hazardous materials were uninterpretable and could not be compiled.

APPENDIX (D) - Continued
Hazardous Waste

SG & SIC NUMBERS	MATERIALS			CONTAINERS			
	TYPE MATERIAL	NEUTRALIZATION	DISPOSAL	TYPE MATERIAL	TYPE CONTAINER	NEUTRALIZATION OR PREPARATION	DISPOSAL
SG #6 - SIC #205, 207 BAKERIES AND CONFECTIONARIES	None Caustic & acid cleaners	Diluted	Sewered	Cleaning compound Caustic & acid cleaners	55 gallon BBL Small containers	None None	External site External site
SG #7 - SIC #206 SUGAR	Caustic	Diluted	Sewered	Caustic	55 gallon BBL	Washed	External site
SG #8 - SIC #208 BEVERAGES	Caustic	Diluted	Sewered	Caustic Caustic	55 gallon BBL Bulk containers	Aging Washed	Salvage container Returned to factory
SG #9 - SIC #209 MISCELLANEOUS FOOD	Caustic cleaner	Diluted	Sewered	Caustic cleaner	55 gallon BBL	None	External site
SG #10 - SIC #225 TEXTILE KNITTING MILLS	None			Dye & cleaning solutions	55 gallon BBL Aerosol cans	Aging	External site 55 gallon salvage
SG #11 - SIC #239 CANVAS & TEXTILE SHOPS	None			None			
SG #12 - SIC #242 SAWMILLS AND PLANING MILLS	Resins & Wood Alcohol None	None	Sewered	None Fungicide	Boxes	None	Burned in boiler

APPENDIX (D)

HAZARDOUS WASTE

SURVEY GROUP SIC NUMBER (SG & SIC)	MATERIALS			CONTAINERS			
	TYPE MATERIAL	NEUTRALIZATION	DISPOSAL	TYPE MATERIAL	TYPE CONTAINER	NEUTRALIZATION OR PREPARATION	DISPOSAL
SG #1 - SIC #196 SMALL ARMS AMMUNITION	Paint & thinner	None	Private collection	Paint & thinner	Under 5 gallons	None	External site
SG #2 - SIC #201 MEAT PRODUCTS	None			Acidic cleaning solution	55 gallon BBL	Washed	Salvage containers
	None			Pyrethrins	Aerosol cans	None	External site
	Cleaning compounds	None	Sewered	Cleaning compounds	Miscellaneous	None	External site
SG #3 - SIC #202 DAIRY PRODUCTS	Caustic	Diluted with H_2O	Sewered	Caustic	Bulk	None	External site
	None			Pyrethrins	Aerosol cans	None	External site
	None			Sulfuric acid	5 gallon	Washed	Salvage containers
SG #4 - SIC #203 CANNED AND PRESERVED FRUITS AND VEGETABLES	None			Piperonyl butoxide	55 gallon BBL	None	External site
	None			Insecticides	Aerosol cans	Burned out	Company property
	Insecticides, Fungicides	None	Company property	Insecticides, Fungicides	Plastic bags	None	External site
	None (consumed in fumigation)			Methyl Bromide	Pressurized tank	N.A.	Returned to factory
	None			Caustic	55 gallon BBL	Burned out	Company property
	Caustic	Diluted	Sewered	Caustic	Bulk	Washed	Returned to factory
	None			Pyrethrins	55 gallon BBL	None	External site
	None			Acid cleaner	55 gallon BBL	Washed	Salvage containers
SG #5 - SIC #204 GRAIN MILL PRODUCTS	None			None			

APPENDIX (D) - Continued
Hazardous Waste

SG & SIC NUMBERS	MATERIALS			CONTAINERS			
	TYPE MATERIAL	NEUTRALIZATION	DISPOSAL	TYPE MATERIAL	TYPE CONTAINER	NEUTRALIZATION OR PREPARATION	DISPOSAL
SG #13 - SIC #2432	None			Contact cement, paint thinner	Miscellaneous	None	External site
PLYWOOD & VENEER PLANTS	None			Phenol formaldehyde powder	55 gallon BBL	Aging	Salvage container
SG #14 - SIC #249	Cresote & penta	Aging	Company-owned settling pond	None			
POLES & MISCELLANEOUS WOOD PRODUCTS	None			Weed killer	One-gallon cans and aerosol cans	None	External site
				Penta chlorophenol	Large paper bags	None	Company property
SG #15 - SIC #2431							
MILLWORK PLANTS	Glue Wash	None	External site	None			
SG #16 - SIC #25							
CABINET AND FURNITURE SHOPS	None			Contact bond cement	Small cans	None	External site
SG #17 - SIC #262, 263							
PULP AND PAPERBOARD MILLS	None			Biocides	55 gallon BBL	Washed	External site
SG #18 - SIC #265							
PAPERBOARD AND PLASTIC CONTAINERS	Acetone	Diluted	Sewered	None			

APPENDIX (D) - Continued
Hazardous Waste

	MATERIALS			CONTAINERS			
SG & SIC NUMBERS	TYPE MATERIAL	NEUTRALIZATION	DISPOSAL	TYPE MATERIAL	TYPE CONTAINER	NEUTRALIZATION OR PREPARATION	DISPOSAL
SG #19 - SIC #27							
PRINTING AND PUBLISHING	Nitric Acid	Chemically neutralized	Sewered	Nitric Acid	Small BBL	None	Returned to factory (then external site)
	Film developer & fixer	Use only	Sewered	Film developer & fixer	55 gallon BBL	Evaporation	External site & salvage container
	Printing roller wash & press cleaner	Use only	Sewered	None			
SG #20 - SIC #28							
CHEMICALS	Phosphorus contaminated metal	None	Company property	None			
	DDT contaminated pellets	None	Applied to field as with regular DDT	None			
	None			Miscellaneous agricultural chemicals	5 gallon	Drain well	External site
SG #21 - SIC #307							
MISCELLANEOUS PLASTIC PRODUCTS	None			None			
SG #22 - SIC #31							
LEATHER PRODUCTS	None			None			
SG #23 - SIC #32							
	Hydrochloric acid	Diluted	Sewered	None			
STONE, CLAY, AND CONCRETE PRODUCTS	Meuratic acid and soap solution	Diluted	Company land	Meuratic acid & soap solution	55 gallon BBL	None	Returned to factory

APPENDIX (D) - Continued
Hazardous Waste

	MATERIALS			CONTAINERS			
SG & SIC NUMBERS	TYPE MATERIAL	NEUTRALIZATION	DISPOSAL	TYPE MATERIAL	TYPE CONTAINER	NEUTRALIZATION OR PREPARATION	DISPOSAL
SG #24 - SIC #33 FOUNDRIES AND SMELTERS	None			None			
SG #25 - SIC #34 FABRICATED METAL PRODUCTS	Sulphuric acid	Use only	Sewered or external site	Sulfuric acid	55 gallon BBL	None	Used for waste chemical storage
	Chromic acid	Dried	External site	Chromic acid	55 gallon BBL	Washed	Salvage container
SG #26 - SIC #35 MACHINERY AND MACHINE SHOPS	Metal DeScaler	None	External site	None			
SG #27 - SIC #36 ELECTRICAL EQUIPMENT	Carbon Tetrachloride	None	Sewered	Carbon Tetrachloride	55 gallon BBL	None	External site
	Caustic	Neutralized	Sewered	Caustic	Miscellaneous	Washed	External site
	Hydrochloric acid	Neutralized	Sewered	Hydrochloric acid	Miscellaneous	Washed	External site
	Cyanide	Diluted (H_2O)	Sewered (drain field)	Cyanide	Small BBL	None	External site
	Miscellaneous chemicals	Diluted or neutralized	Holding pit	Miscellaneous chemicals	Miscellaneous	Washed	External site
SG #28 - SIC #37 TRANSPORTATION EQUIPMENT	None			Acetone, MEK peroxide	5 gallon cans 55 gallon BBL	None	External site Salvage container

APPENDIX (D) - Continued
Hazardous Waste

SG & SIC NUMBERS	MATERIALS			CONTAINERS			
SG #29 - SIC #37	TYPE MATERIAL	NEUTRALIZATION	DISPOSAL	TYPE MATERIAL	TYPE CONTAINER	NEUTRALIZATION OR PREPARATION	DISPOSAL
PREBUILT HOMES, MOBILE HOMES	None			None			
SG #30 - SIC #38, 39							
MISCELLANEOUS MANUFACTURING	Sulfuric acid	None	Buried on company property	None			